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ANALYSIS OF THE FEDERAL AVIATION
ADMINISTRATION'S HOST COMPUTER
ACQUISITION PROCESS AND POTENTIAL
APPLICATION IN DEPARTMENT OF
DEFENSE ACQUISITIONS

THESIS

Barbara J. Cohen
First Lieutenant, USAF

AFIT/GLM/LSY/88S-11

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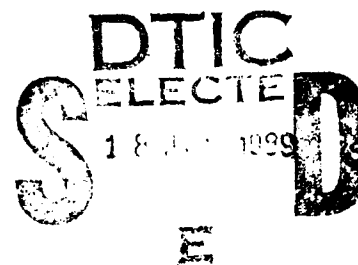
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THESIS

Presented to the Faculty of the School of Systems and Logistics
of the Air Force Institute of Technology

Air University

In Partial Fulfillment of the
Requirements for the Degree of
Master of Science in Logistics Management

Barbara J. Cohen, B.S.

First Lieutenant, USAF

September 1988

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Abstract

The primary purpose of this investigation was to develop an acquisition management strategy applicable to DOD program management that would help program managers achieve acquisition success. An hypothesized management strategy was formulated from the exploration of the successful Federal Aviation Administration's Host computer program. This exploration used personal interviews to identify those management elements and organizational procedures perceived by the 28 respondents to contribute to Host success. The hypothesized management strategy was subsequently evaluated by experts in DOD acquisition. Through personal interviews each element in the management strategy was evaluated for necessity to achieve program success and applicability to DOD programs.

The conclusions and recommendations of the study were based on the results of the DOD acquisition expert opinion survey of the hypothesized management strategy. The result was a management strategy to guide DOD program managers in achieving acquisition success that can be tailored to all programs.

ANALYSIS OF THE FEDERAL AVIATION ADMINISTRATION'S
HOST COMPUTER ACQUISITION PROCESS AND POTENTIAL
APPLICATION IN DEPARTMENT OF DEFENSE ACQUISITIONS

I. Introduction

General Issue

There have been many positive achievements in the Defense Department's management of major acquisitions in the past several years, yet an obvious need exists for additional improvements. Many critics feel that defense acquisition organization and procedures must be revitalized. In July 1985, in response to this perceived need, the President's Blue Ribbon Commission on Defense Management was charged to conduct a study of current defense management and organization. Acquisition organization and procedures were investigated as one of five areas of concern.

The preliminary objective of the Commission was to identify the structural problems limiting success in each of the five areas. As pointed out in An Interim Report to the President, "...there is legitimate cause for dissatisfaction with the process by which the Department of Defense and Congress buy military equipment and materiel" (President's Commission, 1986c:15). The Commission clarifies the reason for dissatisfaction with the following statement: "With

notable exceptions weapon systems take too long and cost too much to produce. Too often they do not perform as promised or expected' (President's Commission, 1986c:13). These shortfalls have a devastating effect on military readiness, and they preclude the attainment of maximum benefit from taxpayer's dollars.

In the forward to A Quest for Excellence, Final Report to the President, Mr. David Packard, the Commission Chairman, concludes that, 'Excellence in defense management will not and can not emerge by legislation or directive. Excellence requires the opposite - responsibility and authority placed firmly in the hands of those at the working level, who have knowledge and enthusiasm for the tasks at hand' (President's Commission, 1986a:forward xii).

Problem Statement

A successful acquisition process must meet budget, schedule and reliability goals, and result in a product that meets user needs. As many critics of the current DOD acquisition process point out, this is not easily done.

The responsibility for achieving acquisition success lies with the program manager (PM). The system acquisition management concept designates a single manager to be responsible for all of the technical and business aspects of a program. The designated program manager is given the authority required to meet the broad and multiple requirements of system acquisition and is held accountable

for the accomplishment of the total management task. The program manager must assemble a management team of personnel from all functional areas to assist in accomplishing the program objectives. As the agent of the service in the management of the system acquisition, and the focal point of authority and responsibility for program accomplishment, the program manager has a demanding and complex job.

The Federal Acquisition Regulations and DOD Directives and Instructions concerning acquisition provide guidance for program managers. This guidance is in terms of end objectives and progress milestones, leaving the program manager with the complex task of determining how to achieve those objectives and milestones. For example, DODD 5000.1, "Major and Non-Major Defense Acquisition Programs," presents the policies of the Secretary of Defense and requires program manager compliance. The intent is to provide guidance. It is not intended to foresee all problems, provide all solutions, or outline all task details. A basic management strategy for program managers that provides a flexible framework of the elements and procedures key to achieving program objectives would effectively augment current guidance.

The President's Blue Ribbon Commission guidance on how to improve the acquisition process indicates that it can best be improved through effective management procedures and organization elements. In An Interim Report to the

President, the Commission states, "The nation's defense programs lose far more to inefficient procedures than to fraud and dishonesty" (President's Commission, 1986c:15).

Based on the Commission recommendations and the noticeable lack of management principles in current guidance, program managers would greatly benefit from a management strategy composed of the procedures and organizational elements that have increased the effectiveness and success of other programs. This strategy would simplify the program management task by providing a proven framework to start with, and to work within. The objective of this research is to use recommendations from current studies, lessons learned from a successful program, and DOD expert opinions to develop an acquisition management strategy that program managers can tailor to their specific program to achieve program success.

Background

The Department of Defense Acquisition System is a single uniform system of policies and practices that governs how equipment, facilities, and services are planned, designed, developed, acquired, maintained and disposed of within the Department of Defense (DOD, 1987:1). DOD Directive 5000.1, Major and Non-Major Defense Acquisition Programs (DODD 5000.1), and DOD Instruction 5000.2, Defense Acquisition Program Procedures (DODI 5000.2), provide policies and procedures for managing defense acquisition

programs. This Directive and corresponding Instruction take precedence over all other DOD issuances, and apply to all organizational levels from the Office of the Secretary of Defense to DOD Field Activities. All DOD issuances providing additional guidance for managing defense acquisition programs are required to be reviewed for conformity with DODD 5000.1 and DODI 5000.2. If an issuance is found to be in conflict, it must be changed or cancelled as appropriate.

DODD 5000.1 presents the policies of the Secretary of Defense to govern acquisition programs and requires program manager compliance. The policies provided cover many issues. Those that apply to program management are:

1. Support national policy and operational objectives with a timely, efficient and effective acquisition system.
2. Streamline the acquisition organization structure.
3. Establish acquisition phases and milestone decision points and to enhance management effectiveness.
4. Enhance program stability by minimizing program changes, by providing realistic estimates, and by establishing program baselines.
5. Tailor the acquisition strategy to meet the unique circumstances of individual programs. (DOD, 1987a:3-6)

The DOD acquisition life cycle is divided into five phases which are separated by decision milestones. DOD Directive 5000.1 policy requires the use of acquisition phases and milestone decision points to manage major defense acquisition programs and, where applicable, non-major acquisition programs. It is important to note that the

Directive specifically states, "These phases are to be tailored to fit each acquisition to minimize acquisition time and life-cycle costs..." (DOD, 1987a:3). If appropriate, phases may be omitted or combined.

The decision milestones are designed to develop a level of confidence in the solution offered and to reduce the degree of technical risk involved. At the end of each phase, validated test results form the information base for the decision to proceed, to redirect and study further, or to terminate programs. The incremental commitment of resources with each decision to proceed also reduces risk (McCarty, 1987:5).

DOD Instruction 5000.2 provides the decision criteria and considerations for each milestone. Action to initiate each phase is contingent upon the decision reached at the preceding milestone. The acquisition phases and milestone decisions of the system acquisition life cycle are outlined below in chronological order (DOD, 1987b:2-4; Long and others, 1987:149-159; McCarty, 1987:8-26):

1. In the operational requirements phase operational deficiencies are identified, operational needs are stated, and the development or improvement of systems or equipment is initiated.

2. The Milestone 0 decision determines mission-need and approves program initiation and authority to budget for

a new program. The commitment extends only to identifying and exploring alternative solutions.

3. In the concept exploration/definition phase alternative solutions defined at Milestone 0 are evaluated, and the best is selected. Limited experiments and tests may be conducted. Some of the primary considerations are: 1) mission area analysis; 2) affordability and life cycle costs; and 3) operational utility assessment.

4. The Milestone I decision considers proceeding with the concept demonstration/validation phase. Broad program cost, schedule, and operational effectiveness/suitability goals and thresholds are established for the alternative(s) selected in the preceding phase.

5. In the concept demonstration/validation phase the technical risk and economic uncertainty are reduced through a more detailed definition of the new system. Primary system hardware prototyping, studies and analysis, or subsystem prototyping with system analysis are used to further define the system.

6. The Milestone II decision considers proceeding with the full-scale development phase, and establishes more specific goals and thresholds. An affirmative decision at Milestone II is a commitment to continue the program through engineering development and to acquire long-lead procurement items required to support operational testing and initial production.

7. In the full-scale development/low rate initial production phase the system design is reviewed and finalized, and the system is developed, produced and tested. Test and evaluation is performed to minimize design risk, to demonstrate that the system meets performance specifications, and to demonstrate achievement of program objectives. The output from this phase includes a pre-production prototype, results of completed operational test and evaluation, production or construction cost verification, the production and deployment schedule, affordability and life cycle costs, plans for integrated logistics support, and a procurement strategy.

8. The Milestone III decision considers proceeding with the full-rate production/deployment phase. An affirmative decision here defines the initial production quantity and approves plans for future production.

9. In the full-rate production/deployment phase, the actual production commitment is formally and contractually accomplished. Testing begun in the full-scale development phase is continued until system performance specification requirements are met. The system, which includes training equipment, spares, facilities and support equipment, is produced for operational use. Deployment begins when a system in operational configuration is provided to and used by operational units.

10. The operational support phase begins at the point of initial operational capability, when the first item is deployed.

11. The Milestone IV decision identifies actions and resources needed to ensure that operational readiness and support objectives are achieved and maintained for the first several years of the operational support phase. This milestone normally occurs one to two years after initial deployment.

12. The Milestone V decision encompasses a review of a system's current state of operational effectiveness, suitability, and readiness in order to determine whether major upgrades are necessary or deficiencies warrant consideration of replacement. This decision point normally occurs five to ten years after initial deployment.

Definitions

The following terms are defined in order to clarify the purpose, analysis, and recommendations of this study.

1. Criteria for Success - The criteria that must be satisfied for an acquisition to be considered successful for the purpose and scope of this study. An acquisition is considered successful if: costs do not exceed budget; the original schedule, or date of delivery, is met; the product meets reliability, maintainability, and availability standards; and the product is accepted by the user and meets the user's needs.

2. Elements for Success - the acquisition management procedures and organizational elements determined by previous research and by analysis conducted in this thesis to increase the potential for successful acquisition. Abbreviated as "elements."

Research Objectives

The objectives of this research were:

1. To discover and analyze the elements for success used to manage a successful acquisition program.
2. To develop an acquisition management strategy based on the elements for success identified that is applicable to DOD program management.

Investigative Questions

This research effort answered the following investigative questions:

1. What criteria must be met for an acquisition program to be considered successful?
2. What management procedures and organizational elements were recommended in previous research to improve the DOD acquisition process?
3. What are the management procedures and organizational elements used by the program management team of a successful development type acquisition?
 - a. Does the program meet the criteria established in the literature review for a successful acquisition?
 - b. Of the elements used, which are perceived by the program management team to be vital to the success of their program?
4. How do the management procedures and organizational elements recommended in previous research compare to those perceived by the program management team to be vital to the success of their program?

5. Which of the elements for success resulting from the analysis of the successful program and previous research form the management strategy that will potentially increase the DOD acquisition success rate?

a. Which of these elements for success do DOD acquisition experts identify as ideas new to DOD?

b. Which of these elements for success do DOD acquisition experts identify as necessary for program success?

c. Of the elements identified by DOD acquisition experts as necessary for program success, which are currently used and which are potentially applicable to the DOD acquisition process?

d. What must be done before the elements for success potentially applicable to the DOD acquisition process can be implemented?

e. For those elements identified by DOD acquisition experts as not potentially applicable to the DOD acquisition process, why were they so identified?

f. For those elements identified by DOD acquisition experts as currently used or potentially applicable, what is the range of applicability?

Scope

This research effort focused on the management strategy of the program manager from contract development to system acceptance. This is the time period when, according to current regulations and guidance, program performance is up to the management and leadership abilities of the PM. Therefore, this is the time period that an acquisition management strategy is most appropriate.

It was required that the successful acquisition program selected for the exploratory study be sponsored by a government agency or industry other than the DOD. The objective behind this requirement was to identify new ways

of handling and managing the section of the acquisition life cycle being reviewed by this research effort. The program selected for the exploratory study was required to be complete or near completion. This was necessary so that all relevant phases of the acquisition life cycle could be evaluated, and so that program success could be determined.

Overview

The next five chapters include: a Literature Review of contemporary reports and recommendations on improving acquisition procedures and organizational elements (Chapter II); the Research Methodology (Chapter III); the results of an Exploratory Study of the Federal Aviation Administration Host Computer System, a joint analysis of the elements identified with the recommendations from the Literature Review, and a management strategy proposed for use in DOD acquisitions (Chapter IV); the results of an Expert Interview analysis of the proposed management strategy (Chapter V); and Conclusions and Recommendations (Chapter VI).

II. Literature Review

Chapter Overview

In the past several years defense management and defense acquisition procedures have been the subjects of numerous studies. This chapter presents a review of literature related to the findings of defense acquisition management studies. The review focused on studies conducted from 1984 through 1987. The initial part of the chapter presents the criteria that must be met for an acquisition to be considered successful according to contemporary literature. The remainder of the chapter discusses the program management procedures and organizational elements recommended to improve the acquisition program success rate. Some of problems that the recommendations were proposed to counter are also presented.

Two major studies served as the basis for revitalizing the current DOD acquisition system. The first study, by the Defense Science Board, Practical Functional Performance Requirements, compared five successful commercial programs with 26 defense programs and served as the basis for the President's Blue Ribbon Commission Study. The second study, conducted by the President's Blue Ribbon Commission on Defense Management, compared the defense acquisition system with other systems, both government and commercial. These

two studies were the catalyst for the September 1987 update of DOD Directive 5000.1 and DOD Instruction 5000.2. They also form the basis of this literature review.

Criteria Defining Acquisition Success

To answer investigative question 1 various system acquisition documents were reviewed. It was found that the criteria that must be met for an acquisition to be considered successful were the same for both DOD and non-DOD programs. According to the Defense Science Board study of the performance requirements aspect of the acquisition process, a program must meet the following criteria to be considered successful (Defense Science Board, 1986:18):

1. The equipment is placed in the hands of the operating forces in sufficient quantities to assist in deterring a war.
2. The program meets the projected schedule. The equipment is available to the operating forces on the date projected.
3. The equipment does not exceed the projected budget, or cut quantities.
4. The equipment performs as projected.

The Office of Management and Budget (OMB) outlined the policies to be followed by the executive branch agencies in the acquisition of major systems in OMB Circular A-109. According to this circular a successful program must meet program objectives. The program objectives were defined as the capability, cost, and schedule goals being sought by the system acquisition program (OMB, 1976:2). In addition to

these program objectives General Bernard Randolph, Commander of the Air Force Systems Command, specified that all individuals in AFSC would be measured by how they supported the using Operational Commanders (Department of the Air Force, 1987c). This measurement criterion was extended to measuring acquisition success.

The criteria outlined in system acquisition documentation were evaluated in conjunction with the criteria specified by several program management experts. It was found that the criteria for determining acquisition success were conceptually alike. The various criteria collected differed only in format. Based on these sources, the following list of criteria that must be met for an acquisition to be considered successful answer investigative question 1:

1. Costs do not exceed budget.
2. Original schedule, or date of delivery, met.
3. Product meets projected performance standards.
4. The product is accepted by the user, and meets the user's needs.

Recommendations For a Successful Program

This portion of the chapter presents the management procedures and organizational elements recommended in previous research to improve the DOD acquisition process. This information is used to answer investigative question 2. Only those recommendations within the scope of management

actions that can be implemented by the program manager to improve the program success rate will be addressed. The following paragraphs briefly describe the studies evaluated in this literature review.

The recommendations in the Defense Science Board report were aimed at strengthening the process by which requirements are generated, iterated, and implemented (Defense Science Board, 1986: Forward, v). This board believed that despite differences in the development processes of commercial and military programs there were some major lessons learned that could be judiciously applied to military programs (Defense Science Board, 1986: Forward, v).

The President established the Blue Ribbon Commission on Defense Management to evaluate the defense acquisition system, to determine how it might be improved, and to recommend changes that could increase the rate of program success (President's Commission, 1986b:1). The Commission examined both DOD and non-DOD programs that had been most successful in acquisition in order to find a model of excellence for defense acquisition. They concluded that meaningful improvement would not come from more regulation, but from major institutional change. The recommendations advocated a new theory of management similar to that applied in Japanese companies and some U.S. companies credited with increasing productivity and quality. Through their

recommendations the Commission hoped to instill the following 'new' management theory into DOD acquisition:

- 1) participation of all of the people involved with the program,
- 2) trust in people and belief that people in the organization want to do a good job,
- 3) people given the opportunity to contribute their knowledge, skill, and enthusiasm to work together to achieve the goals of the organization, and
- 4) supervision minimized, and detailed review of work reduced (President's Commission, 1986a: 41-42).

The Defense Organization Project of Georgetown University's Center for Strategic and International Studies was initiated to identify those actions that would help to build a more effective and responsive defense structure (Gansler, 1985:88-90). Three professors of Systems Acquisition Management for the Department of Research and Information at the Defense Systems Management College, Ft Belvoir VA, conducted a study to find out 'what makes for success in systems acquisition management' and to identify 'what we have been doing right in defense systems management that we want to repeat' (Baumgartner, 1984:31). They selected 12 programs from the 52 identified by the Joint Logistics Commanders as successful. From those 12 programs 47 program managers and their industry counterparts were interviewed.

The following sections present the recommendations of these studies that apply to program management and can be implemented by program managers. A section is devoted to each recommendation. These sections cumulatively provide the answer to investigative question 2.

Program Manager Authority and Flexibility. A primary recommendation of all of the studies was for program managers to be given the authority to make trade-off decisions on their programs, the authority to reject changes to the program baseline, and the authority to execute the program (Defense Science Board, 1985:2; Gansler, 1985:93; President's Commission, 1986b:12,22). This recommendation is not a management procedure to be employed by the program manager. It is included because many of the recommendations listed in subsequent sections of this chapter could not be implemented unless the program manager had sufficient authority to accomplish them.

Stabilize Programs. The need for program and budget stability was recognized by the President's Blue Ribbon Commission, and by the Defense Organization Project Working Group on Weapons Acquisition (Gansler, 1985:93-94; President's Commission, 1986a:59-60). Program stability was seen as necessary to counter growth in the cost of defense equipment due to program stretch-outs. Both groups recommend that program managers make realistic program cost estimates, including factors to cover the risks inherent in

the development of weapon programs. The main point emphasized by the Weapons Acquisition Working Group was that even a well-planned and well-run program could not succeed unless the dollars were available to fund it. In addition to budget stability, both groups recommended that more research be conducted at the outset of weapons development to counter overstated specifications, and that program managers be given the authority to reject changes suggested by other staffs. They emphasized that once the baseline was established the program manager must strictly adhere to it. A baseline was defined as the agreement drafted by the program manager describing functional specifications, cost, schedule, and other factors critical to the program's success submitted for approval to the Defense Acquisition Executive to which the program manager would be held accountable (President's Commission, 1986a:59).

Small, High Quality Staffs. The authority to hand-select high quality personnel was one of the features of most successful commercial programs identified by the President's Blue Ribbon Commission (President's Commission, 1986b:12,13,27). In view of this element for success, the Commission made several recommendations. The recommendation most applicable to the scope of this study was to establish flexible personnel management policies necessary to improve defense acquisition.

Program Office Team Atmosphere. A recommendation resulting from the Defense Systems Management College research effort was for the program manager to delegate authority and responsibility, and to create a team atmosphere (Baumgartner, 1984:36-38). The program managers interviewed believed that the recommended actions would help to train people, increase retention of good people, and free the program manager to handle the big problems. The need to hold individuals accountable, and to involve everyone was also emphasized.

Communications With Users. The need to establish a dialogue with the customer, or user, at the conception of the program and maintain that communication throughout the program was one of the features of most successful programs identified by the President's Blue Ribbon Commission (President's Commission, 1986b:12,13). It was noted that a number of successful DOD programs had incorporated this management feature. Communication with users was also seen to result in motivating the program manager to seek out and address problems, rather than hide them.

The Defense Science Board recommended that the role of the user in the overall DOD guidance and requirements process be expanded (Defense Science Board, 1986:4, 45-47, 52). The board found that the user's role and responsibilities were vital to the development of performance requirements. This recommendation included the

requirement for program managers to ensure that users were cognizant of program and budget priorities and tradeoffs. It was also identified that the role of users should be made more formal early in the requirements generation cycle, and that feedback should be provided on a continuing bases.

Prototyping and Testing. The need to establish a devil's advocate within the program office to seek out operational pitfalls, the need for prototyping, and the need for early operational testing were features of most successful programs identified by the President's Blue Ribbon Commission (President's Commission, 1986b: 12,13,18-20). These needs were reflected in the recommendation that operational testing should begin early in advanced development using prototype hardware. In describing this recommendation the Commission specified that operational testing should be combined with developmental tests of the prototype to uncover operational as well as technical deficiencies. It was noted that this recommendation for prototyping and testing would also contribute materially to improving cost and schedule estimates.

Adherence to Schedule. The Defense Science Board recommended that program managers strictly adhere to the established schedule following acquisition life cycle Milestone II (Defense Science Board, 1986:74,75). Schedule dominance was viewed as a means of preserving program

stability and constraining cost growth. This recommendation also implied that requirements were validated, and that there was funding stability.

Teamwork Relationship Between Government and Contractor. The recommendation ranked most important by the program managers interviewed for the Defense Systems Management College research effort was to establish a teamwork relationship of mutual trust between the government and contractor program management (Baumgartner, 1984:36-38). The need for open communication, a good interface, and joint discussion of problems were identified to be vital.

Conclusion

This summary of the literature reviewed provides the answers to investigative questions 1 and 2. The next chapter presents the detailed methodology employed in answering the remaining investigative questions.

III. Methodology

Chapter Overview

This chapter describes the research methods and specific steps used to answer the investigative questions supporting the two research objectives. For the reader's convenience, the research objectives and supporting investigative questions outlined in Chapter I are restated here. Second, the general approach of the research is presented. Next, the investigative method and analysis process used to meet the first research objective are identified and described, followed by those for the second. The chapter concludes with a summary of the research approach.

Research Objectives and Supporting Investigative Questions

Research Objective I. To discover and analyze the elements for success used to manage a successful acquisition program. Supported by the following investigative questions:

1. What criteria must be met for an acquisition program to be considered successful?
2. What management procedures and organizational elements were recommended in previous research to improve the DOD acquisition process?
3. What are the management procedures and organizational elements used by the program management team of a successful development type acquisition?

a. Does the program meet the criteria established in the literature review for a successful acquisition?

b. Of the elements used, which are perceived by the program management team to be vital to the success of their program?

4. How do the management procedures and organizational elements recommended in previous research compare to those perceived by the program management team to be vital to the success of their program?

Research Objective II. To develop an acquisition management strategy based on the elements for success identified that is applicable to DOD program management. Supported by the following investigative questions:

5. Which of the elements for success resulting from the analysis of the successful program and previous research form the management strategy that will potentially increase the DOD acquisition success rate?

a. Which of these elements for success do DOD acquisition experts identify as ideas new to DOD?

b. Which of these elements for success do DOD acquisition experts identify as necessary for program success?

c. Of the elements identified by DOD acquisition experts as necessary for program success, which are currently used and which are potentially applicable to the DOD acquisition process?

d. What must be done before the elements for success potentially applicable to the DOD acquisition process can be implemented?

e. For those elements identified by DOD acquisition experts as not potentially applicable to the DOD acquisition process, why were they so identified?

f. For those elements identified by DOD acquisition experts as currently used or potentially applicable, what is the range of applicability?

General Approach

The primary assertion of this thesis is that the exploration of a successful program will reveal management processes that facilitate achieving program success that were not previously recommended in research nor used in DOD program management. The goal is to use recommendations from current studies, lessons learned from a successful program, and DOD expert opinions to develop an acquisition management strategy that DOD program managers can tailor to their specific programs to achieve program success.

The general approach used to determine the validity of the primary assertion began with a review of contemporary research efforts in the area of DOD acquisition management. This review resulted in the definition of criteria that must be met for a program to be considered successful, and the identification of the recommendations for improving the DOD acquisition process. Next, a successful program that met all of the criteria of success was selected for exploration. The Federal Aviation Administration's Host Computer System was the program selected. Representatives from each component of the Host program management team were interviewed to identify which managerial procedures and organizational elements they perceived to contribute to Host success. After comparing these elements with the recommendations of current studies, a management strategy for achieving DOD program success was hypothesized. In the

final step, the opinions of DOD acquisition experts were used to evaluate the hypothesized management strategy. The result was a management strategy, based on elements actually used in a successful program, that was applicable to the DOD acquisition process.

Specific Procedures for Answering Research Objective I

Discovering and analyzing the elements for success used to manage a successful acquisition program implies the need to identify the criteria by which a program is judged to be successful or not. In addition, the primary assertion of this thesis must be tested. Investigative questions 1 and 2 addressed these needs, and were answered by the review of contemporary research recommendations for improving the DOD acquisition process. The results of the review, conducted in response to these questions, are reported in Chapter II.

The response to the first investigative question provided the foundation necessary to identify a successful program. In August 1987, two Host computer system experts were interviewed to determine the scope of the proposed research area, and to gather background data on the Host system acquisition. In the second week of September 1987, two briefings were observed and several exploratory interviews were conducted at the Indianapolis Air Route Traffic Control Center (ARTCC). Sufficient background data was gathered to determine that Host did meet all of the

criteria of success, and to establish an appropriate research methodology.

The next step in satisfying the first research objective was to identify the management procedures and organizational elements perceived by the Host program management team to contribute to Host success. Investigative question 3 addressed this need, and was supported by an exploratory case study research method. Personal interviews were the primary source for the data used to answer question 3. Selected members of the program management team were interviewed at FAA Headquarters in Washington D.C. on 25, 28 September, and on 22, 23 December 1987. During these visits, additional documentation was gathered as necessary, and several program meetings were observed. The documentation and observations contributed to content validity, and were used to corroborate the personal interview data.

The final step necessary to satisfy the first research objective was analysis of the data collected. This need was met by investigative question 4, and facilitated by the results from the literature review.

The following sections address the specific elements that compose the methodology outlined above. First, the literature review process is presented, followed by a discussion of why the Host computer system was selected for evaluation. Third, the exploratory case study research

method is defined. Subsequent subsections outline the data collection plan, and discuss the interview sample selection, the interview process protocol, the observation sample selection, and the observation protocol. Finally, the method of data analysis is presented.

Literature Review. The main source for literature review materials was Lt Col Delaney, Chief, Defense Resources Division, System Acquisition Management Department, Air Force Institute of Technology, School of Systems and Logistics at Wright-Patterson Air Force Base. Colonel Delaney identified the primary reports documenting the recommendations of contemporary research conducted in the area of DOD acquisition management. The information in these sources was vital to this research effort.

The materials available in the AFIT School of Systems and Logistics library were reviewed. In addition, several topical searches were conducted through the Defense Technical Information Center. These efforts provided no significant material beyond that previously identified.

Successful Acquisition Program Selection. The two primary criteria for program selection were: 1) all criteria of acquisition success achieved, and 2) key personnel and meetings accessible. The Federal Aviation Administration Host Computer System met both criteria.

James G. Cain, Deputy Director of the FAA Advanced Automation Program Office, identified the Host Computer

System as one of the most successful technical efforts in FAA history (Office of Public Affairs, 1987d:2). The criteria of success identified in the literature review, and the corresponding evidence of Host success are both outlined below (Garwood, 1987a; Marek, 1987):

1. Criterion: Costs do not exceed budget. Host: Host came in under budget.

2. Criterion: Original schedule, or date of delivery, is met. Host: Host had met the implementation schedule in all areas.

3. Criterion: The product meets reliability, maintainability, and availability (RMA) standards. Host: All RMA and technical performance measurements were met or exceeded. This was documented in test results.

4. Criterion: The product is accepted by the user and meets the user's needs. Host: Every control center formally accepted the system. One half of the sites requested permission to drop some preliminary tests and accept early. Every control center continued to use the Host system after acceptance. These examples of user confidence are evidence of system acceptance. In the past some systems have been sent back. In addition, there are currently some devices on location that site managers refuse to use.

Accessibility of the Host program was ideal. Two Air Route Traffic Control Centers, key locations for observing a site survey and a dedication ceremony, were within 200 miles of Wright-Patterson AFB (W-PAFB). The FAA Headquarters in Washington D.C., location of the Host program management team, was a short distance from Andrews AFB which was served by daily operational airlift support from W-PAFB. Most importantly, an excellent past working relationship with two of the program management team implementation specialists afforded access to all facets of the Host program.

Exploratory Case Study Research Method. Research

design can be viewed from many different perspectives. The most apparent perspective for this situation was the degree of problem crystallization. Given this classification, it was determined that an exploratory study would best satisfy the research objective. An exploratory study is characterized by a loose structure and a primary objective of learning. These characteristics allowed Host to be evaluated from many different angles, and facilitated the development of hypotheses for further analysis (Emory, 1985:59). A formal study was considered inappropriate for the exploration of the Host program because it required precise procedures and data specifications (Emory, 1985:60).

Within the scope of conducting an exploratory study, the case study method was selected to carry out the effort. The case study method was selected based on an evaluation of the five main strategies outlined by Robert Yin in Case Study Research Design and Methods. The contemporary focus of the case study method allowed the use of systematic interviewing and direct observation as sources of evidence in addition to document and artifact review. The ability of a case study to deal with a full variety of evidence was a primary strength (Yin, 1984:20). In addition, the case study strategy did not require manipulation of relevant behaviors. This matched the Host objective to minimize experimenter control of relevant behaviors, and the absence

of control over Host's achievement of success. Finally, only the case study strategy addressed the research questions of 'how' and 'why' as operational links to be traced over time (Yin, 1984:16,17). The ability of the case study strategy to support the research requirements outlined above is summarized in this quote from Robert Yin's book:

In brief, the case study allows an investigation to retain the holistic and meaningful characteristics of real-life events--such as individual life cycles, and organizational and managerial processes. (Yin, 1984:14)

Data Collection Plan. As noted above, the wide variety of evidence that can be used is a primary advantage of the case study strategy. The data collection plan used to accomplish the case study exploration of the Host computer system included personal interviews, direct observation, and document reviews. These three data collection techniques were combined so that the weaknesses of each were offset by the strengths of the others (Tull and Hawkins, 1987:115). The following paragraphs describe the characteristics and application of these three data collection methods.

Direct Observation. Direct observation was used to gather background information on Host program management. Corroborating evidence, to either refute or support that gathered during the personal interviews, was also obtained. Direct observation was selected because its flexibility allowed the observer to record aspects of events and behavior as they occurred. This data collection method also

allowed the observer to record unexpected situations, increasing the quality of the corroborating evidence obtained. Direct observation required the observer to be physically present and to personally monitor what took place, resulting in higher quality information (Emory 1985:178).

The observation protocol was designed to support a variety of events and to address the major weaknesses inherent in this method. The events observed included formal program meetings, informal impromptu meetings, a telephone conference, and briefings from the program management team to the user. The primary weakness of the direct observation method was the potential to overload the observer with information (Emory, 1985:178). This weakness was reduced by the following actions:

1. Copies of the briefing slides providing Host background information were obtained and reviewed.

2. A list of the attendees was obtained for all briefings and formal meetings. This list was used to corroborate the degree of teamwork and participative leadership used in the Host program.

After obtaining copies of these records, the observer had sufficient time and concentration to note relevant behavior and attitudes.

Another weakness of the direct observation method was the need for each event to be accessible, and for the observer to be present when the event occurs. This weakness was countered by the characteristics of the events

themselves. Each event had a specific start and end time, allowing the observer to be present for the duration. Given twenty user sites, monthly program meetings, and four trips by the observer to FAA HQ, there were multiple similar events to select from based on accessibility. All events selected as necessary for observation were observed.

Document Review. Document review, a secondary data source, provided valuable detailed information on Host contract elements cited by respondents as important to Host success. Review of 'lessons learned', advisory group publications, and notices from both FAA Headquarters and IBM Offices of Public Affairs also provided corroborating evidence for the personal interview data. These documents came from both internal and external sources which improved the quality of the evidence drawn from them. Document retrieval was facilitated by the extensive library and expert knowledge of Gail Garwood, and by the assistance of Michael E. Perie, System Development Division Manager for the Federal Aviation Administration, Washington D.C.

Personal interview. The primary method of data collection used to support the exploratory case study method were personal interviews. William Emory defines personal interviews as:

A two-way conversation initiated by an interviewer to obtain information from a respondent. ...the topics and pattern of discussion are generally dictated by the interviewer. (Emory, 1985:160)

Personal interviews were selected because the depth and detail of information that could be secured far exceeded that for telephone and mail surveys (Emory, 1985:160). Another strength of the personal interview method was its versatility. It was the only collection method that could be used to gather attitudes and opinions (Emory, 1985:158). The direct interface with the respondent increased the quality of the data by allowing clarification or additional detail to be requested from the respondent as necessary. In addition, the personal interview collection method had higher response rates, and more potential to motivate respondents than the other survey methods. A high response rate was critical because of the relatively small number of Host program management team members.

The interview protocol which supported the Host program exploration was designed to address the major weaknesses inherent in the personal interview data collection method. A primary weakness was that data quality depended on the willingness of respondents to communicate (Emory, 1985:159). This weakness was countered after the initial Host evaluation indicated that program management personnel were interested in the research project, and wanted to cooperate. Another potential weakness was countered by using the expert knowledge of two Host program management team specialists to recommend potential respondents who were knowledgeable and who would provide reliable information (Emory, 1985:159).

Interview Sample Selection. The goal was to present a comprehensive list of the management procedures and organizational elements that contributed to Host success. Gail Garwood and Milton Garwood, Host Computer System Planning and Implementation Specialists, Air Traffic Advanced Automation System Requirements Branch, System Plans and Programs Division, Federal Aviation Administration (FAA) in Washington D.C., were instrumental in establishing the criteria for selection, and in selecting the interview sample.

To achieve the goal of composing a comprehensive list, all FAA Headquarters branches directly involved in the acquisition process were identified. A minimum of one respondent was selected from each. The criteria for selection were number of months of Host experience, and degree of involvement with Host program management. The number of respondents selected from each branch was related to overall branch involvement. Milt and Gail Garwood contributed greatly to the selection of respondents. They assessed both the experience and the involvement of potential respondents, and provided the names and titles of those most qualified. In addition, key positions in FAA regional management, FAA ARTCC staff, Martin Marietta integration staff, and IBM national management were identified. One respondent was selected for each of these

key positions identified. Selection was based on accessibility.

The organizations and functional areas sampled are summarized in Table 3.1. As illustrated in this Table, key organization identification and specific respondent selection were conducted with the intent of maximizing the variety of perspectives represented, and of increasing the content validity.

As the interview process progressed, respondents with the greatest involvement in establishing and implementing Host program management procedures were identified. These key respondents were interviewed several times to increase data reliability. The 28 individuals interviewed during the exploratory study of Host are listed in Appendix A: Host Computer Program Interviewees.

Interview Protocol. A primary weakness of personal interviewing is the degree of bias that can be introduced by the interviewer. An interview protocol was defined and implemented to counter this weakness, and to reduce response deviations due to nonstandard interviewing procedures. Before implementation, the interview protocol was reviewed by Milt and Gail Garwood and Colonel Delaney. In Business Research Methods, William Emory listed the following broad criteria for a successful personal interview (Emory, 1985: 161):

1. Accessibility by the respondents to needed information.

Table 3.1

Summary of Sample Population - Host Computer Program

Organizations Sampled and Functional Areas Represented	Total Number Interviewed
<u>Federal Aviation Administration (FAA)</u>	
Air Traffic Plans and Requirements Service	1
System Development Division	1
Contracting Officer	1
Contracting Officer Technical Representative	1
Headquarters Program Management Team Participants	
Information Systems Branch	1
Software Requirements Branch	1
Computer Complex Program Branch	1
System Requirements Branch	2
Host Computer System Branch	3
Host Systems Implementation Branch	5
Total	13
Regional Program Management Team Participants	
Airway Facilities Division	-
Air Traffic Plans and Programs Division	1
Automation Engineering	2
Total	4
Air Route Traffic Control Center, End User	2
Total FAA Personnel Interviewed	23
<u>Martin Marietta Corp.</u>	
Regional Integration	1
<u>International Business Machines (IBM) Corp.</u>	
Host Computer System:	
Program Service Executive	1
Repairability, Maintainability and Availability	1
Field Deployment	1
Physical Planning	1
Total IBM Personnel Interviewed	4
=====	
Total Number of Individuals Interviewed	28

2. An understanding by the respondents of their roles.

3. Motivation of the respondent to accept such a role and to fulfill its requirements.

The interview protocol developed for Host was based on these criteria. A summary of that protocol is outlined below.

1. Accessibility by the respondents to needed information was addressed by sample selection procedures. Only individuals who met the selection criteria were interviewed.

2. Gail Garwood personally contacted each selected individual to set up an interview appointment. At that time she briefly covered the purpose of the research and the role expected of the respondent. Arranging all interviews through Gail, a well known and highly regarded Host program management team member, increased respondent motivation to accept the role. It also lent credibility to both the research and the researcher.

3. In all cases, either Milt or Gail Garwood briefly introduced the interviewer to the respondent, and then departed before the data collection began. This personal introduction provided evidence to respondents that the research was sanctioned by FAA management, and reassured them that the purpose of the interview was to gather information versus to audit. The introduction also relaxed and motivated the respondent while increasing the credibility of the interviewer. Milt and Gail departed

after the introduction so that the respondent could answer freely and without influence.

4. Continuing with the introduction, the respondents were told that their names and positions would be recorded with their interview responses. They were then given the opportunity to decline the interview. All respondents expressed the desire to continue. The lack of anonymity did not adversely affect the quality of the responses because the research objective and interview questions were of a positive nature, and were not threatening.

5. To conclude the introduction, the research objectives were explained to outline the role of the respondent, and to spark the respondent's interest. The respondent was informed that the kind of answer sought was their opinion or perception. The program management experience of the interviewer was also addressed so that the respondent would have an idea how complete each answer should be.

6. During the interview, the opening questions were read directly from the 'interview session organization' sheet to increase interview standardization. The interviewer requested clarification of responses and additional information from the respondent as necessary. These subsequent questions provided minimal guidance, and were carefully worded so that the respondent would not be 'lead' to a specific answer.

The interview questions were general and open ended to match the intent of an exploratory study. According to William Emory, unstructured in-depth interviews are often used in exploratory research, especially in case research among various participants in a major event (Emory, 1985:203). When conducting unstructured in-depth interviews the interviewer's task is to encourage the respondent to talk about a set of topics given minimal prompts and guiding questions (Emory, 1985:203). The interview questions posed to the acquisition program management team and contractor representatives were:

1. Do you believe that Host was a successful program?

2. Why do you believe that it was (or was not) successful?

3a. If the subject did not believe that Host was a successful program: What do you perceive prevented this success?

3b. If the subject did believe that Host was a successful program: Why do you think that Host was successful? Added for clarification: What do you perceive that the program management team did to achieve this success?

7. Responses were recorded as they were given. This reduced interviewer bias and ensured accurate recording.

Observation Sample Selection. For each Air Route Traffic Control Center (ARTCC), the Host computer system implementation plan outlined seven key events to be accomplished at staggered intervals. Of those seven events, four marked the completion of testing and validation

procedures. Due to the minimal activity to be observed, these four events were eliminated from consideration for selection: 1. hardware delivery, 2. initial operating capability, 3. operational readiness demonstration, and 4. government acceptance.

During the remaining three events numerous activities were accomplished. In addition, these events involved all ARTCC members, and contained the contributions of program management team members from both FAA Headquarters and IBM Federal Systems Division. A description of these three events follows (Martin Marietta, 1986:5-20):

1. The Preliminary ARTCC Site Survey, held six months before Host hardware delivery. Program management team representatives to presented informative briefings, addressed site member's concerns and assigned action items to prepare for hardware delivery.

2. The Second ARTCC Site Survey, held one month before Host hardware delivery. Program management team representatives presented a more detailed informative briefing, gathered additional feedback, ensured that all action items were accomplished, identified the contractor site team, and ensured that both the facilities and personnel were prepared for hardware delivery.

3. Dedication of the Host Computer System. A major event attended by state dignitaries, program management team representatives, FAA top management and all ARTCC members. This event signaled final success. The site had accepted and was using the Host Computer System.

Due to the numerous activities and participants available for observation, these three events were considered for selection. The Preliminary Site Survey was eliminated from consideration for observation because all 20 ARTCCs had passed this event. The Indianapolis ARTCC was

selected as the location to observe the Second Site Survey. The Cleveland ARTCC was selected as the location to observe a Host Computer System Dedication. Both of these sites were selected based on accessibility and date constraints. According to several FAA program management team members, events at these two sites were representative of all sites.

The other meetings or events attended to gather corroborating evidence were selected based on accessibility and interview schedule constraints. Appendix B: Host Computer Program, Events Observed, outlines the events observed during the exploratory study of Host. These events are listed in chronological order.

Observation Protocol. An observation protocol with minimal standardization was selected because it best benefited the heuristic nature of the exploratory study (Emory, 1985:179). According to William Emory in Business Research Methods the observation protocol must answer the question of who, where, when, how, and what within the context of minimal standardization (Emory, 1985:181). In addition, the observer-subject relationship and observation setting must be addressed (Emory, 1985:178-181).

Who, required identification of the subject to be observed (Emory, 1985:181). All of the events selected for direct observation involved a specific and finite group of participants. The behavior and attitudes of all participants were relevant, and provided corroborating

evidence for evaluating the personal interview data. The subjects selected for observation within each event were the participants, including meeting leaders or briefers.

Where, required identification of the sites to be used for observation. The selection of these sites was discussed in the preceding subsection.

When, required that the importance of the time of observation be addressed (Emory, 1985:182). This was not a relevant issue because each event was attended from start to finish.

How, required that the process of recording the data, and method of observation be addressed (Emory, 1985:182). The method of observation selected was direct and simple, as outlined previously in the subsection on data collection. The data was recorded as it was observed. The next section addresses the content specification.

What, required that those specific conditions, events, and/or activities to be observed be identified (Emory, 1985:182). The goal was to collect evidence to either corroborate or refute the data collected from the personal interviews. Both factual and inferential variables were of interest. The following factual variables were selected for observation: 1. the general category of the issues discussed or the information presented, 2. the participants, categorized by functional organization or program management position, and 3. the actions or status reports resulting

from the feedback received from users. Observation of these variables was used to identify communication channels, to determine degree of participation and user involvement, and to assess program management teamwork. The following inferential variables were selected for observation: 1. the degree of cohesion and agreement among briefers, 2. the enthusiasm of the participants and/or users, 3. the receptiveness of the briefers or meeting leaders to feedback, and 4. the general attitude of the briefing or meeting host. Observation of these variables was used to assess program management teamwork, commitment to user involvement, and user satisfaction with both the Host implementation process and the computer system.

The observation protocol addressed the observer-subject relationship in terms of directness of observation, observer participation, and observer concealment. As previously discussed, the direct method best met the need to obtain corroborating evidence. The observer did not participate in the event under observation. This was in accordance with case study method requirements. The observer sat behind the participants with a FAA Headquarters program management team member, and noted the attitudes and behavior of the participants. Milt Garwood, Gail Garwood, and Captain Kenneth Jennings, an expert in management and behavior in organizations, all believed that it was not necessary to

conceal the observer. They believed that there was minimal risk of atypical activity by the subjects due to observer presence because the observer posed no threat and blended in with the numerous participants.

Data Analysis. After the interviews were conducted, the responses of each respondent were formally documented. The management procedures and organizational elements perceived by the respondents to be vital for achieving Host success were initially reviewed to extract the basic concepts underlying the elements. Previous study of classical management theory, organizational dynamics, and the role of management in organizations was vital to identifying these underlying concepts. The elements were then reviewed in detail and categorized according to the basic concepts identified. The recommendations of previous research to achieve program success were used to further categorize and analyze the elements. The resulting management strategy was composed of six management categories, each supported by five to six elements. This management strategy was then evaluated by DOD acquisition experts to answer the investigative questions supporting the second research objective. The analysis process and subsequent results from the exploratory case study of Host are presented in Chapter IV.

Specific Procedures for Answering Research Objective II

The exploratory case study research conducted to meet the first research objective resulted in a management strategy hypothesized to aid DOD program managers to achieve success. In Exploring Marketing Research, by William Zikmund, the researcher was cautioned not to stop after the initial exploratory stage. Mr. Zikmund emphasized the need to analyze the attributes identified during exploration before implementation to reduce the risk of erroneous implementation (Zikmund, 1985:118). To meet the second research objective, DOD acquisition experts analyzed the elements identified during the exploratory case study of the Host computer system.

Investigative question 5 addressed the need for analysis and was answered by data collected from the expert opinion method. Experts in the DOD acquisition community were asked to determine which of the hypothesized elements formed the management strategy that would potentially increase the DOD acquisition success rate. A progressive series of supporting questions was used to facilitate this determination. First, sub-question 5a asked each expert to identify which elements contained new concepts. The next iteration, met by sub-questions 5b and 5c, asked the experts to identify the elements necessary for program success regardless of application or current regulation, and then to categorize the elements. Each expert, according to his/her

own experience, categorized the elements as either currently used in DOD, not used but potentially applicable, or not used and not applicable. The third series of sub-questions was contingent on the category assigned by the expert to each element. For the elements identified as potentially applicable to DOD, sub-question 5d asked the expert to identify what had to be done before the element could be implemented. For the elements identified as not applicable to DOD, sub-question 5e asked the expert to explain why. Finally, for the elements identified as currently applied or potentially applicable to DOD, sub-question 5f asked the expert to assess the range of programs for which the element was appropriate.

The final step necessary to satisfy the second research objective was analysis of the data collected. Evaluation and tabulation of the expert responses to investigative question 5, and its six sub-questions, met this need and are presented in Chapter V.

The following sections address the specific areas composing the methodology outlined above. First, the expert opinion research method is defined. Next, the interview sample selection is discussed, followed by an outline of the interview process protocol. Finally, the method of data analysis is presented.

Expert Opinion Research Method. Again, an exploratory study was most appropriate for meeting the research

objective. The exploratory research process used so far has progressively narrowed the scope of the research problem and identified attributes for investigation. The purpose of the exploratory research conducted to meet the second research objective is to screen alternatives (Zikmund, 1985:101). The elements hypothesized to compose the management strategy that will help DOD program managers increase program success rates were screened, or evaluated, to determine which were feasible. This step in the research process was accomplished with an experience survey.

An experience survey was conducted to get information that would provide the insight necessary to sharpen the concepts already identified (Emory, 1985:63; Zikmund, 1985:43). Mr. Zikmund defined an experience survey as a process of discussing concepts with knowledgeable managers who have had personal experience in the field to obtain insights into the relationships among variables (Zikmund, 1985:44,102). William Emory explained that the researcher would profit from using experience surveys because "published data are...seldom more than a fraction of the existing knowledge in a field of interest...and persons experienced in the area of study can provide insight-stimulating information" (Emory, 1985:63).

Experience surveys can be very informal, or slightly structured (Zikmund, 1985:103). The need to ensure content validity and data reliability required the development and

implementation of an interview protocol to provide some structure. In addition, selection criteria were defined and used. In accordance with literature on research methodology, the experience survey involved a small number of interviews with experienced people who were carefully selected (Zikmund, 1985:103). The interview protocol was developed following this methodology guidance. Few formal questions were asked, and the expert was allowed to discuss the questions with few constraints. Respondents were selected based on qualifications, rather than by a representative probability sample (Zikmund, 1985:103).

Interview Sample Selection. Lt Col Gary Delaney, Chief of the Defense Resources Management Division, Department of System Acquisition Management, School of Systems and Logistics, Air Force Institute of Technology, located at Wright-Patterson AFB, OH, was instrumental in establishing the criteria for selection, and in selecting the interview sample. The goal was to identify DOD acquisition experts. For the purpose of achieving this research objective, experts were defined by the breadth of their program management experience, and by the perspective afforded by their position. It was determined that to obtain reliable data on the validity and applicability of the hypothesized program management strategy, an expert should have program management experience over several programs. In addition, it was determined that the overall perspective of a DOD

policy maker for program management was desired. An expert working in a policy making position would have the broad perspective and information access necessary to determine each strategy element's contribution to acquisition success, to define element applicability, and to identify any shortfalls. For expert selection, the first consideration was breadth of experience, second was position, and third was accessibility.

It was determined that each of the following offices were potential locations for the experts that would meet the criteria established above, and should be represented in the interview sample: 1) Office of the Secretary of the Air Force, 2) Office of the Secretary of the Air Force, 3) Headquarters Air Force Systems Command Staff, and 4) Defense Systems Management College staff. The respondents were selected on the basis of recommendation. Lt Col Delaney telephoned personal contacts in each of the areas selected, described the purpose of this research, explained the criteria for expert selection, and obtained the names of individuals who the contact believed would satisfy the criteria. Table 3.2 lists the titles of the eleven individuals interviewed.

Interview Protocol. The interview protocol for conducting the expert interviews was based on the three criteria for a successful interview previously discussed.

Table 3.2

Summary of Sample Population - DOD Acquisition Experts

Organizations Sampled and
Titles of Individuals Interviewed

Office of the Secretary of Defense, Under Secretary of
Defense (Acquisition), Directorate (Program Integration)
Director

Office of the Assistant Secretary of the Air Force
Deputy Assistant Secretary of the Air Force
(Acquisition Management and Policy)

Directorate of Contracting and Manufacturing Policy
Associate Director

Directorate of Program Planning and Integration
Director

Headquarters Air Force Systems Command
Principal Assistant to the Deputy Chief of Staff,
Contracts
Deputy Chief of Staff,
Technology and Requirements Planning
Chief,
Programs, Analysis and Initiatives Division
Inspector General

Defense Systems Management College
Course Director for Policy
Professor of Engineering Management

The Analytic Sciences Corporation
Manager,
Defense Acquisition Management Department

Total Number of Individuals Interviewed 11

Before implementation, the interview protocol was reviewed by Lt Col Delaney, and the interview questions were reviewed by several faculty members. The protocol followed while conducting each interview is contained in Appendix E: DOD Expert Interview, Interview Session Organization. A description of the protocol development follows.

1. Each selected individual was contacted by letter and asked to grant a 30-45 minute interview. The letters were signed by Lt Col Delaney, and explained the purpose of AFIT, and the purpose and methodology of the research. Attached to the letter was a brief fact sheet on the Host Computer System to familiarize the reader with the program, and to justify why Host was considered to be a success. The Colonel's signature and AFIT letterhead lent legitimacy to the study. The information attached motivated the respondent to participate. A sample of the initial letter is contained in Appendix C: DOD Expert Interview, Request For Interview Letter. Appendix D: DOD Expert Interview, Host Program Fact Sheet contains a sample of the letter attachment.

Of the twelve individuals contacted, eleven granted an interview and one declined because of schedule conflict. A replacement with equivalent position and experience was selected, contacted, and agreed to participate. Another respondent was later eliminated after it was decided that he

did not meet the experience criteria. All interviews were conducted in the respondent's office.

2. The interview began with a brief statement about the purpose and methodology of the research to refresh the respondent's memory and to increase interest in the project. Next, respondents were asked for permission to include a brief summary of the interview, including name and position, in an appendix to the thesis. This lack of anonymity did not adversely affect the quality of the responses because the interview questions were not of a personal nature, and because the respondents were given the opportunity to edit the resulting paraphrase. The objective of the interview, the proposed agenda, and an overview the respondent's role were then covered.

3. After the introduction, each respondent was asked if the interviewer could share with them some of the reasons that the Host program management team perceived that Host was successful, and if the respondent would use his/her expert perception to determine if there was anything new, or potentially applicable to the way DOD manages programs. The respondent was asked if they had any questions or comments about their role, the research methodology or the Host computer system acquisition. These actions ensured that the respondent understood their role, and also provided some motivation to participate.

4. Having completed the introduction and established a rapport with the respondent, the interview protocol focused on gathering data. A summary of the elements hypothesized to form the management strategy for achieving program success was handed to the respondent. The source of the elements and the development of the six categories containing them was briefly explained. A copy of this handout is contained in Appendix F: DOD Expert Interview, Reasons For Host Success.

5. The process of addressing each of the six categories began after the respondent was given a few minutes to review the proposed management strategy. For each category, an explanation of the general area was followed by a brief overview of why the Host program management team believed that the area contributed to achieving program success. After the category introduction, the respondent was asked to answer specific questions about each element.

The interview questions were designed to support unstructured in-depth interviews. This category of interviews was selected because it was most appropriate for dealing with complex topics (Emory, 1985:203). The interview questions were open ended to allow the respondents, each an acquisition expert, to address the areas they believed to be relevant to the strategy evaluation. This corresponds to the purpose of using an

expert opinion methodology. The areas addressed by each question corresponded to the final investigative question. Each respondent was asked the following questions for each element:

a. Does this element contain a concept that is new to DOD program management?

b. Is this element necessary for an acquisition program to be successful? If not: Why?

If the answer to question b was affirmative, then the following questions were also asked about the element:

c. Is this element currently used or potentially applicable to the DOD acquisition process?

1) If not: Why?

2) If yes: What is the range of programs to which this element applies?

3) If not currently used, but potentially applicable: What must be done before this element can be implemented?

The interviewer prompted the respondent for details or clarification as necessary. Each individual was asked the same questions, and subsequent leading questions were avoided. Each respondent determined which elements they were qualified to evaluate.

6. Responses were recorded as they were given to reduce interviewer bias and ensure accurate recording. To provide a method for quickly referencing the element corresponding to respondent comments, each element was assigned a unique two character identifier and listed on a

master outline. This master outline was used to record each interview.

7. After all of the categories had been discussed, the respondent was asked to both verify and clarify the main points recorded. This increased content validity. In closing, respondents were informed that a paraphrase of their comments would be sent within seven days for their review and annotation. The respondents were also asked for permission to include the reviewed paraphrase of their comments in an appendix to the thesis, and direct quotes from that paraphrase in the analysis of the management strategy.

8. The interview was concluded by thanking the respondent for his/her time.

9. Respondents all received an interview follow-up package. The package included a letter thanking the respondents for their time and specific contributions, and a paraphrase of the interview. The respondent was asked to edit, adjust or comment directly on the draft as necessary. The letter also reminded the respondent that the edited interview paraphrase would be included in an appendix to this thesis, and direct quotes may be included in the body. The "Host Fact Sheet" and "Menus for Success" were enclosed to provide easy access to any background information that the respondent could require. A stamped and addressed envelope was provided to facilitate the return process. To

avoid suspending the respondent while meeting time constraints the letter stated that no response would be interpreted as acceptance of the interview paraphrase. A sample follow-up package is included in Appendix G: DOD Expert Interview, Thank You and Request For Review Letter.

Data Analysis. After the interviews were conducted, the comments of each respondent were formally documented. The interview paraphrases were then submitted to each respondent for review. Nine of the eleven respondents edited and returned their interview paraphrases. These replaced the initial draft paraphrases and were used as the data source for further analysis. The analysis was conducted element by element. The comments and responses for each element, across all interviews, were grouped together. The degree of cohesion between respondents as to the importance and applicability of each element was noted. Next, the investigative sub-questions were answered for each element. The answers indicated which elements should remain in the management strategy, and which should be eliminated.

In almost every interview the respondent suggested additional elements that he/she believed were critical for program success. These suggestions were listed and the frequency of suggestion was tabulated. The Host contracting officer technical representative, Arthur Simolunas, and the Air Traffic Plans and Requirements Service Director, Theodore Beckloff, were informally interviewed on 21 July

1988. The purpose of these interviews was to obtain answers to the questions raised during the DOD expert opinion interviews and to evaluate the additional suggested elements. Based on the responses of these two high level managers within the Host program, some of the suggested elements were added to the management survey. The result was a program management strategy believed by DOD acquisition experts to increase the acquisition success rate. The analysis process is presented in Chapter V.

Summary

A successful contemporary acquisition program was selected for initial analysis by this research. The Federal Aviation Administration Host Computer System was selected because it met or exceeded all criteria of success identified in the literature review, and because it was accessible. The exploratory case study of the Host program resulted in the identification of the management procedures and organizational elements perceived by the Host program management team to contribute to Host success. Analysis of these elements in conjunction with the recommendations presented in the literature review culminated in a hypothesized management strategy to assist DOD program managers achieve success. Chapter IV evaluates the results of the exploratory case study and outlines the analysis process.

The expert opinion research method was used to analyze the hypothesized management strategy. The results of the expert survey are reported and analyzed in Chapter V.

In reviewing the research methodology presented and the data evaluation outlined in following chapters, it is important to remember the limitations of the exploratory research techniques. First, conclusions based on qualitative data may be subject to considerable interpreter bias (Zikmund, 1985:117). This limitation was minimized by using rigorous interview protocols, and by limiting interpretation of data to documented respondent comments. Second, "Exploratory research can not deliver what it does not promise" (Zikmund, 1985:118). "Exploratory research is not intended to provide conclusive evidence...usually this type of research is conducted with the expectation that subsequent research will be conducted if conclusive evidence is required" (Zikmund, 1985:35). The management strategy resulting from this research effort has been evaluated by experts, but if conclusive or causal evidence is required, then formal causal research must be conducted.

IV. Host Exploration Findings and Analysis

Chapter Overview

This chapter presents a discussion of the data collected during the exploratory case study of the Federal Aviation Administration's Host computer program. The findings and analysis are divided into ten sections. First, the research question and supporting investigative questions to be answered in this chapter are restated. The second section presents a brief description of the Host computer system. The subsequent section provides the results by which Host was determined to be successful. The next six sections discuss the responses received to the interview questions, analyze those responses, and present the findings. These sections contain the answer to investigative question 3b. The final section compares the data collected during the exploratory case study with the recommendations of previous research reported in Chapter II. The answer to investigative question 4 is then presented.

Research Objective and Supporting Investigative Questions

The Federal Aviation Administration's Host computer program was selected as the successful program for exploration. In response to investigative question 3a, the Host computer program was found to meet all of the criteria for a successful program. The analysis supporting this

finding was accomplished in the Successful Acquisition Program section of Chapter III. Representatives from each component of the Host program management team were interviewed to identify which managerial procedures and organizational elements they perceived to contribute to Host success. After comparing these elements with the recommendations of current studies, a management strategy for achieving DOD program success was hypothesized. This analysis provided the data to achieve the first research objective.

Research Objective I. To discover and analyze the elements of success used to manage a successful acquisition program.

Investigative Question 3. What are the management procedures and organizational elements used by the program management team of a successful development type acquisition? This investigative question is answered through the following two sub-questions:

a. Does the program meet the criteria established in the literature review for a successful acquisition?

b. Of the elements used, which are perceived by the program management team to be vital to the success of their program?

Investigative Question 4. How do the management procedures and organizational elements recommended in previous research compare to those perceived by the program management team to be vital to the success of their program?

Host Description

Automation was introduced into the air traffic system in the early 1970s. The first automation program processed flight plan information and prepared flight progress strips. Later, the program was designed to process the radar information, resulting in the radar displays currently used by air traffic controllers (Office of Public Affairs, 1987a:1).

The Host Computer System developed by IBM was one of the first installments of the FAA multi-billion dollar plan to modernize the National Airspace System (NAS). Host serves as the backbone processor for the new Initial Sector Suite System until replacement by Advanced Automation Processors in the mid-1990s (Garwood, 1988b). IBM won this 197 million dollar contract in July 1985.

Host replaced the 20-year-old IBM 9020 computers that were located in the nation's 20 Air Route Traffic Control Centers (ARTCC). The new IBM mainframe computers were ten times faster and had five times the storage capacity of the old IBM 9020 computers. The replacement involved minimal changes to existing National Airspace System (NAS) software (Office of Public Affairs, 1987a:1). Total NAS software had more than two million lines of code, and Host had 130,000 lines of new or modified NAS code (Office of Public Affairs, 1987b:1). According to FAA Administrator Donald D. Engen, "[Host] will allow the air traffic control system to keep

pace with projected traffic growth over the next decade and accommodate the introduction of new automation functions that will both enhance safety and increase controller productivity" (Office of Public Affairs, 1987a:1). Host features included increased capacity, improved reliability, faster response time, and greater on-line availability (Office of Public Affairs, 1987b:1).

Host Success

According to James G. Cain, Deputy Director of the Advanced Automation Program Office, "the Host program has been one of the most successful technical efforts in FAA history. Beginning with the first delivery to the Seattle center in November 1986, the FAA-IBM team has met or surpassed every major program milestone" (Office of Public Affairs, 1987c:2).

Gail Garwood, Host Computer System Planning and Implementation Specialist, presented the following items used as proof that Host was successful (Garwood, 1988a):

1. Every ARTCC accepted the system. This was a direct measure of user confidence. In the past some systems were sent back. With Host, sites requested permission to drop some preliminary tests and accept early.

2. Every ARTCC used the system after acceptance. It is up to the site manager whether to use a new system or not. There are currently some devices on ARTCCs that site managers refuse to use.

3. Host met, or was ahead of, the implementation schedule in all areas.

4. All reliability, maintainability and availability (RMA) standards and technical performance measurements (TPM) were met or exceeded. This was documented in test results.

5. ARTCCs requested that the transition switches be disconnected 60 days early.

6. Host came in under budget.

According to James G. Cain, Deputy Director of the Advanced Automation Program Office, "Much of the credit for this [Host success] goes to the FAA and contractor personnel in the field. They have been committed from the start to making this program work and have done an outstanding job" (Office of Public Affairs, 1987c:2).

Summarizing the beliefs of the Host planning and control specialists, Milton Garwood states that, "The Host Computer Program has been one of the most successful technical efforts in FAA history" because of the total dedication of all FAA and contractor personnel (Garwood, 1988b). A spirit of "team work" has prevailed at all levels.

In an FAA memorandum Carlo Yulo, the Operational Test & Evaluation Division manager, wrote, "Much of the success in the first Host computer system implementation effort is attributable to the commitment and esprit de corps of the people involved..." (Yulo, 1988:1).

Richard Marek, Program Manager, Host Implementation Program, stated that Host was the most successful rehosting in government (Marek, 1987:1). According to Mr. Marek, Host met or exceeded every requirement because of intensive

monitoring and control actions. He also attributed Host success to the gathering and subsequent use of feedback from all program levels. To emphasize the innovation of the Host contract administration Mr. Marek listed the following "Host firsts," elements that had never been used in an FAA program before:

1. Extensive field involvement. Four million dollars was spent to involve the user.
2. Extensive unstructured testing to ensure that the system would not do anything unexpected.
3. Use of an award fee type contract to motivate the contractor. IBM received 80 percent of the payment on ARTCC acceptance as long as there were no type I errors. The other 20 percent was awarded when IBM achieved RMA and TPMs above contract level.
4. All line requirements in the contract were identified and specific responsibility was assigned to an individual to ensure that requirement was achieved. Both the contractor and the responsible FAA individual signed their initials beside each requirement after it was validated. Between 500 and 1,000 requirements were identified and individually validated.
5. All problems, regardless of who identified them or which test they were identified during, were recorded and visible in the INFO problem system.

These Host "firsts" will be discussed and analyzed with the other elements perceived by the Host program management team to contribute to Host success in the following sections. The sections correspond to the basic concepts underlying the elements identified by the Host program management team. Previous study of classical management theory and organizational dynamics, and review of the recommendations of contemporary acquisition management research were used to

extract these underlying concepts. The six concepts extracted are: 1) contract, 2) teamwork, 3) participative leadership, 4) focus, 5) contractor and system monitoring, and 6) testing and training.

Contract

The Host program management team members believed that the first step to Host acquisition success was to establish an environment conducive to program management through elements in the contract and statement of work. Mike Rymond stated that the entire award fee process was a key to Host success, and that the award fee was written to ensure that the contractor emphasized what the program office believed to be important. Linda Strand, the Contracting Officer, expanded on the need to use contract elements for motivation. She noted that one of the reasons that Host was so successful was because the contract was tailored to the different elements being procured. The other major reason for Host success, according to Linda, was the joint use of an incentive fee and an award fee in the contract. She emphasized that one fee should not be used without the other. The combination of the award fee with the incentive fee locked the contractor in and motivated the contractor to meet both schedule and cost objectives. To use an award fee without an incentive fee could cause schedule slippage, and to use an award fee without an incentive fee could cause cost overruns.

The Host computer system was implemented at twenty different sites. One of the elements credited with Host success was the 'waterfall' implementation schedule that was used. Carroll Workman was not alone in his belief that passing the lessons learned from each site implementation to subsequent sites was critical. As Host implementation progressed the number of problems significantly decreased, reflecting the usefulness of sequential implementation.

The Host program management team believed that a program schedule objective could not be achieved unless the program started with a realistic schedule. Carroll Workman emphasized the amount of work put into establishing a realistic schedule for Host. The schedule was developed by working backwards from the twenty projected delivery dates, and included a degree of slack to cover program risk. He attributed much of Host achieving success to the use of a realistic schedule.

Diane Ravenscroft noted that one of the 'Host firsts' was to include money in the program budget to support participative requirements. She viewed this as a major reason for Host success because without those funds the program office would have been unable to involve the user to the extent necessary.

The program office worked very closely with the user to develop the Host requirements. This was an area of concern because lack of success in previous programs had been

partially attributed to user changes in requirements. After being closely involved in developing the requirements the user did not need to make subsequent changes. As Don Leabo stated, 'first you have to force people to organize what they want, then you can provide it' (Leabo, 1988).

Preston Martin and Gail Garwood were just two members of the program management team who perceived that the contract clause tying problem resolution to the contractor's payment schedule was a key contributor to Host success. By jointly classifying and prioritizing problems, the contractor was able to maximize the benefit from scarce manpower resources. This contract element also motivated the contractor to resolve problems as soon as possible because lack of timely resolution impacted subsequent deliveries and payment.

The contract concept management procedures and organizational elements perceived by the Host program management team to be vital to Host success are summarized in Table 4.1. These elements partially answer investigative question 3b.

Teamwork

The following statement by Arthur Simolunas, Contracting Officer Technical Representative, that the biggest thing that contributed to Host success was the teamwork summarized the Host program management team's perception of their joint role with the contractor. A term

Table 4.1

Concept: Contract

Summary of The Elements Perceived By
The Host Program Management Team
To Contribute To Host Success

- * Award Fee and Incentive Fee Used Jointly (CPIF/AF)
- * Waterfall Implementation Plan
- * Realistic Schedule Providing Some Slack
- * Funds Budgeted to Support Participative Requirements
- * Detailed Requirements Generated by the User
- * Problem Resolution Impacts Contractor Payment Schedule

frequently used by the Host team members was 'unified front.' This term symbolized all of the teamwork elements perceived to contribute to Host success. The Host 'unified front' was accomplished through what was described as a painful process of frequent meetings to resolve differences in program perceptions and goals. The result of these meetings was a determination of what the joint position would be, and the full support by both FAA and IBM team members of that position. These comments about concern for teamwork and unity were corroborated by the data collected from the direct observation of Host events. Refer to Appendix B: Host Computer Program, Events Observed, for a

listing and description of the events observed. During the these events, both government and contractor representatives showed an obvious desire to cooperate. Within the FAA team the substantial effort to minimize the long-standing conflict between Air Traffic (AT) and Airway Facilities (AF) personnel was evident. For example, two regional representatives, one AT and one AF, traveled to the site survey together, and prepared a joint site visit report on their return. Normally two different reports reflecting two different views would have been filed.

James (JR) Young, Host System Implementation Specialist, stated that in the beginning no one knew who was responsible for what, so everyone applied common sense and asked a lot of questions. He admitted that early in the program there was a lot of reluctance to cooperate, but added that a cohesive team was built before the contract was even awarded. JR believed that involving all team members in planning and scheduling helped to ensure that everyone was going in the same direction, and to ensure that all areas were covered. Lateral communication was perceived to be a vital element in facilitating team cohesiveness. To be effective, team members had to be given the flexibility to go searching for answers informally across functional boundaries.

James Young noted that top management had confidence in the team's ability, and let the team members set up their

own informal team structure and accept responsibilities instead of having responsibilities assigned. The team members perceived the freedom to accept responsibilities and to be innovative as key elements in achieving Host success.

The Host concept of teamwork also extended to problem resolution. In the beginning of the contract performance period IBM ran into software development problems. Both IBM and FAA program team members believed that Host would not have been successful if their efforts had not been pooled to resolve the problems.

The teamwork concept management procedures and organizational elements perceived by the Host program management team to be vital to Host success are summarized in Table 4.2. These elements provide an additional piece of the answer to investigative question 3b.

Table 4.2

Concept: Teamwork

Summary of The Elements Perceived By
The Host Program Management Team
To Contribute To Host Success

- * All Constituents Involved in Planning and Scheduling
- * Lateral Communication Channels Open
- * Frequent Meeting Used to Resolve Differences
- * Responsibilities Accepted, Not Assigned
- * One Face to Users and Management
- * All Functions Involved in Problem Resolution

Participative Leadership

The perception that user involvement contributed directly to Host success permeated every interview. As stated by Don Leabo, "involving users and operators at every step of Host development caused some problems, but the benefits greatly outweighed those problems" (Leabo, 1988). Users helped to make design tradeoffs, aided software debugging, and were directly involved in testing. User involvement was credited with facilitating implementation.

The dedication to user involvement was reflected in the four million dollars budgeted and funded to support participative requirements. This dedication was reflected in the detail of information provided to users, and the quantity of feedback gathered from users. The users were educated about Host contract administration, provided with points of contact in case of problems, forewarned of potential problems to watch for, and given access to INFO, the problem database. The Host program management team believed that keeping users informed was vital to Host success. The team stated that requesting feedback from the user contributed to user acceptance. They also stated that using the feedback requested was critical to obtaining user support. Allowing users to voice disagreements and concerns was perceived to be an important element in preventing minor details from halting or hindering implementation.

Andrew Bowman, a computer technician at the Indianapolis ARTCC summarized the importance user involvement. He stated, "People are not worried about Host, they are eager and excited" (Bowman, 1987). When asked why he believed that the users were enthusiastic he replied, "Because they were briefed from the beginning on the benefits of Host, because they were told what their responsibilities would be and how they would fit into Host implementation and use, and because everyone was trained and confident that they would be able to perform their job when the new system arrived" (Bowman, 1987).

The participative leadership concept management procedures and organizational elements perceived by the Host program management team to be vital to Host success are summarized in Table 4.3. These elements provide an additional piece of the answer to investigative question 3b.

Focus

Don Leabo summarized the program management team's perception of the elements of configuration management when he said that to keep changing the requirements or program scope was to never finish the program. Michael Perie added that Host was a difficult program, but that staying within the original program scope, and ensuring that specifications were met resulted in program success. Mr. Perie emphasized, "What we said we were going to do in 1982 is what we focused on doing, and finally did" (Perie, 1987). Every team

Table 4.3

Concept: Participative Leadership

Summary of The Elements Perceived By
The Host Program Management Team
To Contribute To Host Success

- * Site Representatives Involved From Start to Finish
- * User Input Requested In All Areas and All Phases
- * Site Input Actually Used
- * Users Kept Informed, Frequent Site Briefings and Memos
- * Problems Solved at the Lowest Level Possible
- * Users Allowed to Voice Disagreements and Concerns

member commented that an important factor in achieving success was keeping changes to a minimum. This meant that no elements determined to be in the 'nice to have' category were added. The team members emphasized that requirements stability and focus on program scope contributed to Host meeting budget and schedule objectives.

Configuration management principles were extended to managing the studies performed by Host support contractors. Don Leabo stated that a key to Host success was focusing support contractors and screening all proposed studies. He emphasized that an independent group was needed to assess

program status, but that only those studies that would eliminate some nonperformance or increase performance should be allowed.

The focus concept management procedures and organizational elements perceived by the Host program management team to be vital to Host success are summarized in Table 4.4. These elements provide an additional piece of the answer to investigative question 3b.

Table 4.4

Concept: Focus

Summary of The Elements Perceived By
The Host Program Management Team
To Contribute To Host Success

- * No Bells, Whistles, or Additional Fixes Were Added
- * Innovation Restricted to the Original Program Scope
- * Studies Performed by Support Contractors Limited

Contractor and System Monitoring

The Host program management team had made detailed plans and preparations for how they were going to ensure that the system received met all of the specifications outlined in the contract, and for how they were going to

ensure that program goals were met. These plans and preparations were perceived to contribute directly to Host success.

Don Leabo stated that Host met, or exceeded, every requirement because each requirement was assigned to a specific FAA individual who was held accountable to ensure that the requirement was met. Mike Rymond explained the concept. He stated that the contract requirements were broken into like-groups, an appropriate FAA team member was put in charge of each group, and the program schedule was built around the dates that each group of requirements was to be met. He added that the FAA team member was held accountable for validating that the group of requirements were met, and was required to initial beside each requirement as it was met.

Another part of the Host program management team's planning and preparation for program success, was establishing the standards, by which the system was later judged, up front. Program management team members also emphasized the importance of ensuring that the standards were achievable.

A management information system developed by IBM, attributed with contributing to Host success, was the INFO system. INFO was used to trace and record all of the problems identified in Host. It was accessible from every FAA site, and was viewed by the Host program management team

as invaluable. Once a problem was entered into INFO it could not be eliminated, only categorized. Problems could only be categorized as resolved by the individual who entered the problem originally. This procedure ensured that nothing was covered up or hidden. Some of the benefits of having all problems visible were: 1) trends could be identified, and 2) resolution efforts were not duplicated. INFO was also attributed with increasing Host reliability, and helping with configuration management.

A significant event, termed the six month slip, revealed the importance of monitoring program progress parallel to contractor monitoring. The FAA team believed that it was important not to go solely by the contractor's progress reports because they would slant the reports to their best benefit. Without the parallel monitoring, both Bennie Sanford and Don Leabo believed that what ended up as a six month delay would have been an eighteen month delay.

The contractor and system monitoring concept management procedures and organizational elements perceived by the Host program management team to be vital to Host success are summarized in Table 4.5. These elements provide a piece of the answer to investigative question 3b.

Testing and Training

The Host program management team members carefully evaluated the importance of testing and training during initial program planning and scheduling. Both were

Table 4.5

Concept: Contractor and System Monitoring

Summary of The Elements Perceived By
The Host Program Management Team
To Contribute To Host Success

- * Actual Demonstration of Requirement Before Sign-off
- * Technical Performance Measures Established Up Front
- * Repairability, Maintainability, and Achievability Standards Established Up Front, and Achievable
- * All Problems Categorized and Visible in INFO Database
- * Numerous Indicators of Program Progress Used

determined to be significant factors in whether a program would be successful or not. Don Leabo stated that testing must be conducted as far up front as possible. He added that early testing was expensive, but countered that it had to be accomplished whether it was done early or not. Don also stated that if testing was done early there would be more lead time for problem resolution.

One of the Host 'firsts' was to conduct unstructured testing. This testing was conducted by users without a scripted scenario. The unstructured tests revealed hundreds of problems above and beyond those already identified by the

structured testing. Don Leabo pointed out that unstructured testing was necessary because structured testing and related fixes to problems identified could be manipulated, but with unstructured testing they could not.

Involving the user in testing was perceived to be vital to the quick acceptance of the Host system. This involvement also was credited with giving sites an emotional stake in implementation, and with improving Host reliability.

The Host training requirements were developed with user input, and follow up was conducted to assess effectiveness. User training was believed to directly affect user acceptance. Milt Garwood explained the importance of Host training before system delivery. He noted that Host would change the clerical role of the computer technicians to a role directly interfacing with the system. To increase user confidence and to ensure that the site would be prepared before Host delivery the operators were sent to the FAA Academy for six weeks of training. The computer operators were also involved in system testing.

After Host delivery, site specific testing was conducted to fine-tune the system, and to ensure that there were no major problems. This testing also uncovered lessons learned that were passed on to other sites.

The testing and training concept management procedures and organizational elements perceived by the Host program

management team to be vital to Host success are summarized in Table 4.6. These elements provide the final piece of the answer to investigative question 3b.

Table 4.6

Concept: Testing and Training

Summary of The Elements Perceived By
The Host Program Management Team
To Contribute To Host Success

- * Testing as Early in Development as Possible
- * Both Structured and Unstructured Testing Conducted
- * User Involved in Planning and Performing Test Scenarios
- * Site Personnel Trained Before System Delivery
- * After Delivery, Detailed Site Specific Testing Conducted

Comparison With Recommendations In Previous Research

The literature review conducted in Chapter II identified eight elements recommended in previous research to improve the DOD acquisition process. The previous sections of this chapter have cumulatively answered investigative question 3b by reporting the elements that were perceived by the Host program management team to be

vital to Host success. The next step is to evaluate the elements identified by the Host program management team with the elements recommended in Chapter II. The following paragraphs will reiterate the recommendations from previous research, and compare them to the findings from the exploratory case study of Host. The conclusions drawn from these paragraphs will be used to answer investigative question 4.

The need for program manager authority and flexibility was identified in all of the studies reviewed. The Host program manager was given sufficient authority and flexibility to make tradeoff decisions as necessary, and delegated substantial responsibility and authority to the team members. This delegation permitted the Host program management team to be innovative and flexible. The elements in the Host teamwork concept reflect the need for this authority and freedom.

The need for program stability was recognized both by previous research and by the Host program management team. The elements in the Host focus concept reflect the need for requirements stability.

Previous research also noted that a small, high quality staff was a common feature of successful programs. The Host program management team members did not perceive this to be a factor in achieving Host program success. Evaluation of the efforts expended by the team members did indicate that

the group was small and of high quality. This recommendation is not part of the teamwork concept elements, but it was a part of the Host program.

A program office team atmosphere, supported by more specific recommendations, was identified by previous research as an important factor in program success. The Host program management team also perceived teamwork to be a critical factor in the success of their program.

The need to communicate with users was identified as a factor common to successful programs, and was a recommendation for improving the DOD acquisition process. The elements of the Host participative leadership concept also reflect this need.

Prototyping and testing were recommended by previous research as methods for uncovering problem areas as well as methods to improve cost and schedule estimates. The Host program did not involve prototyping, so that section of the recommendation is not a factor in this evaluation. The need for testing was identified, and an entire group of elements within the context of testing were perceived by the Host program management team to contribute to Host success.

A second area of stability addressed by previous research was the recommendation that program managers strictly adhere to the established schedule. The Host program management team addressed scheduling, but their

focus was on the need for a realistic schedule to begin with.

The final recommendation listed in Chapter II is the need for a teamwork relationship between the government and the contractor. The Host program management team perceived this to be a critical area. Several elements in the context of teamwork were perceived by the Host team to contribute to Host success.

In summary, the answer to investigative question 4 is that the elements perceived by the Host program management team to contribute to Host success are in agreement with the recommendations of previous research. The first research objective has been achieved. The next chapter presents the findings and analysis to achieve the second research objective.

V. Expert Survey Findings and Analysis

Chapter Overview

This chapter presents a discussion of the data collected during interviews with DOD acquisition experts. The expert survey findings and analysis are divided into seven sections. First, the research question and supporting investigative questions to be answered in this chapter are restated. The second section describes the effectiveness of the data collection method. The next three sections discuss the responses received to the interview questions, analyze those responses, and present the findings. The findings presented in these three sections contain the answers to investigative question 5. Several of the respondents identified elements that they believed were necessary for program success and were missing from the hypothesized management strategy. These recommendations are presented and evaluated in the next section. In the final section the management strategy that accomplishes the second research objective is outlined.

Research Objective and Supporting Investigative Questions

DOD acquisition experts analyzed the elements identified during the exploration of the Host computer system. This analysis provided the data to achieve the

second research objective. That analysis and the resulting management strategy are presented in this chapter.

Research Objective II. To develop an acquisition management strategy based on the elements for success identified that is applicable to DOD program management.

Investigative Question 5. Which of the elements for success resulting from the analysis of the successful program and previous research form the management strategy that will potentially increase the DOD acquisition success rate? This investigative question is answered through the following seven sub-questions:

- a. Which of these elements for success do DOD acquisition experts identify as ideas new to DOD?
- b. Which of these elements for success do DOD acquisition experts identify as necessary for program success?
- c. Of the elements identified by DOD acquisition experts as necessary for program success, which are currently used and which are potentially applicable to the DOD acquisition process?
- d. What must be done before the elements for success potentially applicable to the DOD acquisition process can be implemented?
- e. For those elements identified by DOD acquisition experts as not potentially applicable to the DOD acquisition process, why were they so identified?
- f. For those elements identified by DOD acquisition experts as currently used or potentially applicable what is the range of applicability?

Data Collection

A primary goal of the interviewer was to motivate the respondent to accept his/her role in the survey process and

to fulfill the requirements of that role (Emory, 1985:161). All of the respondents were interested in the research area and were enthusiastic about participating. The willingness of the respondents to accept their roles in the survey process was reflected in the amount of time that they willingly gave to the interview. A time block of 30 to 45 minutes was scheduled for each interview. The shortest interview lasted 1.0 hour, the longest lasted 3.5 hours, and the average was 1.5 hours. Another indication of respondent motivation was the volume of unsolicited comments and documents. Five of the eleven respondents provided copies of new initiatives, regulations, and document drafts to augment their comments. All but two of the respondents addressed issues and made comments above and beyond those outlined in the interview protocol.

Each respondent was asked the same general questions for each element in the hypothesized management strategy. The respondent was asked to clarify points or to provide additional information when needed. Appendix E: DOD Expert Interview, Interview Session Organization, lists the questions asked of each respondent. The data collected from these questions was used to answer investigative question 5.

The respondents addressed only the categories and elements in which they felt sufficiently knowledgeable. Expert survey protocol allows respondents to discuss the interview questions with few constraints and to limit

comments to those areas which they determine that they are qualified to address (Zikmund, 1985:103). In addition, the respondents primarily commented on the elements that they either advocated or opposed. The elements that respondents believed were obviously necessary or regularly applied received few comments. At the conclusion of the expert survey, all of the elements had been evaluated and the interview questions had been answered.

Each respondent received a thank you letter and a paraphrase of his/her comments for review and approval. The instructions stated that if a response was not received, then the paraphrase would be assumed to be approved as it was. Two months later, nine responses had been received and all of the paraphrases were finalized. Appendix H contains an approved interview paraphrase for each respondent and is organized in alphabetical order by respondent.

The hypothesized management strategy which resulted from the exploration of the successful Host computer system acquisition is outlined in Table 5.1, Reasons For Host Success. The expert respondents were given a similar outline to facilitate their evaluation. Table 5.1 reflects the corresponding code for each element. This code is used throughout the chapter, in both text and tables, to reference specific elements.

Table 5.1

Reasons For Host Success:
Elements Listed With Reference Code

<u>Code</u>	<u>Element</u>
Contract:	
C1.	Award Fee and Incentive Fee used jointly (CPIF/AF)
C2.	Waterfall implementation plan
C3.	Realistic schedule providing some slack
C4.	Funds budgeted to support participative requirements
C5.	Detailed requirements generated by the user
C6.	Problem resolution impacts contractor payment schedule
Teamwork:	
T1.	All constituents involved in planning and scheduling
T2.	Lateral communication channels open
T3.	Frequent meetings used to resolve differences
T4.	Responsibilities accepted, not assigned
T5.	One face to users and management
T6.	All functions involved in problem resolution
Participative Leadership:	
P1.	Site representatives involved from start to finish
P2.	User input requested in all areas and all phases
P3.	Site input actually used
P4.	Users kept informed, frequent site briefings and memos
P5.	Problems solved at the lowest level possible
P6.	Users allowed to voice disagreements and concerns
Focus:	
F1.	No bells, whistles, or additional fixes were added
F2.	Innovation restricted to the original program scope
F3.	Studies performed by support contractors limited
Contractor and System Monitoring:	
S1.	Actual demonstration of requirement before sign-off
S2.	Technical Performance Measures established up front
S3.	RMA established up front, and achievable
S4.	All problems categorized and visible in INFO database
S5.	Numerous indicators of program progress used
Testing and Training:	
A1.	Testing as early in development as possible
A2.	Both structured and unstructured testing conducted
A3.	User involved in planning and performing test scenarios
A4.	Site personnel trained before system delivery
A5.	After delivery detailed site specific testing conducted

Elements Identified as New Concepts

Each expert respondent was asked to identify the hypothesized management strategy elements that contained new or unique program management concepts. This information was used to answer investigative question 5a. Lt Col Paul Huegel summarized the group consensus when he stated, 'Everything here has been thought of long before' (Huegel, 1988).

One element was identified by one respondent as a potentially new concept. Element F3., Studies performed by support contractors limited, was identified by Col Ralph Tourino as an interesting catch, something that he had never seen written down before. To answer investigative question 5a, it was found that none of the elements composing the hypothesized management strategy were concepts new to DOD.

Element Necessity

This section presents the range and general sentiment of the responses received to the second interview question. This information was used to answer investigative question 5b. The second interview question required the respondents to evaluate each element and to determine if that element was necessary for an acquisition program to be successful. During the evaluation the respondents identified several elements that would require revision before being considered to be necessary. The recommendations are presented with the analysis of the appropriate element. For the elements

determined by general consensus to be not necessary, the reasons for the determination are presented. The presentation and analysis of respondent comments are divided into six sections. The sections correspond to the six categories of the hypothesized management strategy.

Tables 5.2 through 5.7 are used to summarize the responses received to the interview question, "Is this element necessary for an acquisition program to be successful?" A table is devoted to each of the six categories. Each element composing the hypothesized management strategy is listed by its reference code in the table corresponding to the appropriate category. Table 5.1 can be used to cross-reference each code to the matching element.

In Table 5.2 through 5.7, the qualitative comments of each respondent were quantified into the appropriate columns for each element. The No Comment column was selected if the respondent did not address the element, either specifically or indirectly, during the interview. The Not Necessary column was selected if the respondent specifically mentioned that the element was not necessary for program success. The Necessary After Revision column was selected when the respondent recommended major revisions to the element, and commented that the modifications would make the element necessary. The Necessary column was selected both when the respondent specifically stated that the element was

necessary, and when the respondent indicated approval of the element.

The numbers listed under each response column indicate the percentage of respondents whose comments about the corresponding element fit the described response. The percentages were calculated based on a total of eleven respondents. The percentages for each element sum to approximately 100 percent. The dashes indicate that there were no responses concerning the element of interest that fit that described response.

Contract. This section discusses and analyzes the responses to the second interview question for the elements listed under the Contract category. The section is divided into seven subsections. A subsection is devoted to each of the six elements in this category. The final subsection will summarize the results. Table 5.2 summarizes the findings concerning element necessity that are applicable to the Contract category.

Award Fee and Incentive Fee Used Jointly (CPIF/AF). All of the respondents addressing element C1 believed that it was necessary for program success. Ms. Darleen Druyun summarized the necessity of this element, "It is important to match contract type to inherent program risk. If this is not done, then the contract is put into a mission impossible situation" (Druyun, 1988). Mr. Daniel Rak emphasized the importance of element C1 when he

Table 5.2

Category: Contract

Summary of Responses To The Interview Question:
Is This Element Necessary For An
Acquisition Program To Be Successful?
(in percentages, eleven respondents)

Code	No Comment %	Not Necessary %	Necessary After Revision %	Necessary %
-----	-----	-----	-----	-----
C1.	27	-	-	73
C2.	45	-	-	55
C3.	27	-	-	73
C4.	9	18	45	27
C5.	18	55	18	9
C6.	45	27	-	27

commented that maximum latitude in management and flexibility could be attained simply by varying the share ratio between incentive fees and award fees (Rak, 1988). Based on unanimous approval, element C1 was found to be necessary for program success.

Waterfall Implementation Plan. Six respondents addressed element C2. They unanimously agreed that element C2 was necessary for program success. The group consensus was that a waterfall implementation plan was an obvious requirement. This element was found to be necessary for program success.

Realistic Schedule Providing Some Slack. For element C3, Mr. Thomas Christie's comments epitomized the opinions of the eight respondents who addressed this element. He stated that a realistic schedule providing some slack was vital to program success. This element was found to be necessary for program success.

Funds Budgeted To Support Participative Requirements. There were a wide range of responses to element C4. Ten out of eleven respondents addressed this issue. All ten agreed that it was necessary to include the funding requirements to support user participation in some budget estimate. The disparity of opinion was whether to include the participative requirement in the program budget or to include it in the user's budget.

Two respondents stated that element C4 was not necessary. Their opinions were capsulized in the following statements by Joseph Drelicharz, 'It is neither wrong nor bad for users to fund their own TDYs to support the project. The user's willingness to do this is a good measure of user desire and interest' (Drelicharz, 1988).

Five respondents believed that it was not important whether the user's funds or the program's funds were used to support the requirements. Their concern was that the requirements were included somewhere.

Three respondents believed that element C4 was a good idea, and worth looking into. Lt Col Paul Huegel summarized the opinions of the other two respondents when he stated, 'The idea here is good. This is definitely an area that requires attention' (Huegel, 1988). Colonel Huegel emphasized the importance of this element in the following statement, 'General Randolph, Commander of Air Force Systems Command (AFSC), wants AFSC people to meet with the user, to keep close to the user, and to know the user's needs--but the TDY funds are not there to do it' (Huegel, 1988).

The majority of the respondents recommended that element C4 be revised. They believed that revision of this element would make it necessary for program success. It was found that element C4 required revision. In addition, it was recommended that DOD look into the possibility of

including funding for participative requirements in the program budget.

Detailed Requirements Generated By the User. All of the respondents agreed that element C5 was not necessary as it was currently written. These attitudes were capsulized in Col (Ret) James Lindenfelser's statement, "The user should generate the need, not the detailed requirement" (Lindenfelser, 1988). Mr. Joseph Drelicharz emphasized, "The user doesn't necessarily have the knowledge and information to define the requirements for high technology and black boxes" (Drelicharz, 1988).

Six respondents commented that element C5 was not necessary. They added that users were directed by regulation to generate the Statement of Need, not detailed requirements. These six respondents did not mention potential modifications that could make this element necessary for program success.

One respondent, Col Ralph Tourino, believed that element C5 was necessary for program success. He stated that, "User involvement in requirements definition is vital" (Tourino, 1988).

The two remaining respondents believed that a revised version of element C5 was necessary for program success. Lt Col Paul Huegel's comments summarized both opinions. Colonel Huegel pointed out that it was necessary for the requirements process to be driven by the user. If it was

not, then unnecessary requirements could easily creep in. He went on to caution that requirements generated by the user in terms of end product instead of need could lock the procuring agency into only one alternative. Colonel Huegel proposed that element C5 be revised to reflect the necessity of having users generate requirements in terms of operational need.

It was found that element C5 would be necessary in revised form. This conclusion was reached because the revision suggested by Colonel Huegel was in line with the statements of the six respondents who determined that this element was not necessary as it was written.

Problem Resolution Impacts Contractor Payment Schedule. The respondent opinions concerning the necessity of element C6 were equally split. Of the six respondents who commented on this element, three believed that it was not necessary, and three believed that it was. The following statements by Mr. Joseph Drelicharz summarized the opinions of those who believed that element C6 was not necessary: "Be careful, this element could take away the contractor's motivation. From the contractor's point of view: "All of these safeguards!" "Don't you trust me?" "Aren't we a team?" (Drelicharz, 1988).

The following statement by Col Harry Gillogly III epitomized the opinions of the respondents who believed that element C6 was necessary, "A good way to motivate the

contractor' (Gillogly, 1988). Col (Ret) James Lindenfelser provided more support for this element when he stated that a successful program had to have a cooperative contractor, and that cooperation could be achieved through this element.

After further evaluation, a similarity between the two groups was identified. Both groups recognized the need to generate contractor cooperation. The disagreement centered around achieving that cooperation. If the specific contract provision was replaced with the general need met by that provision then both groups could potentially agree that element C6 was necessary. Therefore, it was found that element C6 would be necessary in revised form.

Findings. The answers to investigative question 5b for the elements in the Contract category are summarized below:

- C1. Necessary.
- C2. Necessary.
- C3. Necessary.
- C4. Revise to: Funds budgeted by either user or program office to support participative requirements.
- C5. Revise to: Requirements generated by the user in terms of operational need.
- C6. Revise to: Include specific contract provisions to encourage contractor cooperation.

Teamwork. The group consensus was that teamwork was necessary. The following statements epitomize the opinions of most of the respondents: 1. 'To succeed, the program

manager must preach and practice teamwork' (Huegel, 1988),

2. 'Integrating all functions is vital' (Druyun, 1988), and
3. 'Teamwork is necessary' (Christie, 1988; Douglass, 1988).

The respondents were hesitant to address the necessity of each individual element, even though they acknowledged the necessity of the category. This was due to concerns about potential conflicts of interest, historical lack of cooperation between the government and the contractor, and specific program applicability. This statement by Colonel Gillogly clearly voiced one of the major concerns felt by many respondents, 'Teamwork is important, but remember that some displacement is needed between the program management team and the contractor' (Gillogly, 1988). Another area of concern was revealed when Mr. Daniel Rak stated, 'The degree of teamwork necessary and appropriate is dependent on the type of contract' (Rak, 1988). The experts recognized both the benefits and the obstacles to teamwork, but were hesitant to make definitive statements about the specific elements.

The responses to the second interview question, applicable to the elements listed in the Teamwork category, are discussed and analyzed in the following seven subsections. A subsection is devoted to each of the six elements in this category. The final subsection will summarize the results. Table 5.3 summarizes the findings

Table 5.3

Category: Teamwork

Summary of Responses To The Interview Question:
Is This Element Necessary For An
Acquisition Program To Be Successful?
(in percentages, eleven respondents)

Code	No Comment %	Not Necessary %	Necessary After Revision %	Necessary %
-----	-----	-----	-----	-----
T1.	36	-	-	64
T2.	45	-	27	27
T3.	55	-	18	27
T4.	64	27	-	9
T5.	64	-	-	36
T6.	36	18	-	45

concerning the necessity of the elements in the Teamwork category.

All Constituents Involved in Planning and Scheduling. All of the respondents commenting on element T1 agreed that it was necessary for program success. The group opinion was summarized by Colonel Tourino's statement that involving all constituents in planning and scheduling was very good. He added that this element facilitated the need to dig in and get a meeting of the minds. Several respondents also voiced comments of caution. Mr. Kemp cautioned that the program manager must be sure that someone was in charge of the process. Mr. Drelicharz qualified his approval by stating, "This element is necessary as long as the basic baseline is already nailed down, and is used as the basis for planning and scheduling" (Drelicharz, 1988). Cognizant of the cautions, it was found that element T1 was necessary for program success.

Lateral Communication Channels Open. Six respondents addressed this element. Of these six, three believed that element T2 was necessary, and three believed that some modification was required. The respondents who desired revision did not argue with the basic element. They all agreed that lateral communication was both needed and important. The concern was that the entire issue was not addressed. Mr. Drelicharz summarized the situation when he stated, "This statement is inadequate. Communication must

be vertical, lateral, and include the outside chain of command' (Drelicharz, 1988).

The varying opinions between the two groups was evaluated. The respondents who identified element T2 as necessary evaluated it in terms of its specific contribution to program success. They did not evaluate it against all of the other communication channels that a successful program should have. The respondents who suggested modification of element T2 agreed that it was necessary, but emphasized that it was insufficient as stated.

By revising this element both groups would be satisfied. It was found that element T2 would be necessary in revised form. It was also recommended that the suggestion to keep the outside chain of command informed be evaluated for addition to the management strategy.

Frequent Meetings Used to Resolve Differences.

Five of the eleven respondents addressed this element. Three respondents determined that element T3 was necessary as stated. Colonel Huegel emphasized the importance of this element when he stated, 'This is in line with the idea of contractor/government team effort, which is necessary' (Huegel, 1988).

The other two respondents believed that element T3 was insufficient. The following statements by Colonel Tourino summarize the opinions of the respondents requesting revision, 'Frequent meetings are not a prescription for

success themselves. Meetings are important to keep the channels of communication open, but everyone needs to know why they are there, and the action items need to be tracked' (Tourino, 1988). Lt Col Robert Angeli further clarified the required modification when he stated, 'It is especially important to have an agenda for each meeting' (Angeli, 1988).

All of the respondents addressing element T3 recognized the need for frequent meetings to resolve differences. Several respondents also noted that some important issues were not addressed. It was found that element T3 was necessary, and that the additional items noted should be evaluated for addition to the management strategy.

Responsibilities Accepted, Not Assigned. The majority of the respondents did not address this element. Of the four respondents that did comment, one believed that element T4 was necessary for all programs, and three believed that it was not necessary for program success. Colonel Angeli, who believed that T3 was necessary, stated, 'The less authoritative method of trying to sell the task may be a better idea. It makes a lot of sense' (Angeli, 1988). The other three respondents all agreed that it was nice to assign responsibilities, but not necessary for achieving program success. The group opinion was summarized by Mr. Ira Kemp's statement that the decision to assign or sell responsibilities depended on the quality of the

individual, the practicality of staffing, and the degree the program manager trusts his/her people. None of the three respondents stated that this element was necessary for program success.

This element was found to be not necessary for program success. Although, it was recommended that program managers allow team members to accept responsibilities instead of assigning them wherever practical.

One Face to Users and Management. The four respondents that addressed element T5 unanimously agreed that it was necessary for program success. Mr. Drelicharz's comment that this element was vital to program success epitomized the group opinion. This element was found to be necessary.

All Functions Involved in Problem Resolution. The majority of the respondents addressed this element. Five identified element T6 as necessary for program success. The necessity of this element was summarized by Colonel Huegel's statement, "If the program manager does not work with the contractor to resolve problems, then the chances of poor program execution increase accordingly (Huegel, 1988).

Two respondents commented that element T6 was suitable only in certain situations, and not necessary for program success. The following comments by Mr. Rak summarized both opinions that element T6 was not really necessary: "This element is not always applicable. It depends on how much

responsibility the government wants to take for the solution which goes back to what the contractor is being paid to do' (Rak, 1988).

The majority of the respondents believed that this element was necessary. Therefore, it was found that element T6 was necessary for program success. In addition, the program manager was cautioned to continually evaluate the degree of responsibility being accepted by the government in problem resolution.

Findings. The answers to investigative question 5b for the elements in the Teamwork category are summarized below:

T1. Necessary.

T2. Revise to: Both lateral and vertical communication channels open.

T3. Necessary.

T4. Not Necessary.

T5. Necessary.

T6. Necessary.

Participative Leadership. The group consensus was that participative leadership was necessary for program success. The opinions of the nine respondents who addressed the elements in this category are reflected in the following statements: 1. 'Program managers have got to have the user on their team' (Lindenfelser, 1988), 2. 'All of these items are absolutely essential' (Gilligly, 1988), and 3. 'The user must be intimately involved. By involving the users, they

understand the tradeoffs that have been made and the acceptance rate is higher" (Druyun, 1988).

The responses to the second interview question regarding the elements in the Participative Leadership category are discussed and analyzed in the following paragraphs. The results will be synopsized in the last paragraph. Table 5.4 summarizes the findings concerning the necessity of the elements in the Participative Leadership category.

The range of responses to elements P1 and P2 was limited. Of the respondents who addressed these elements, one believed that P1 and P2 required revision, and the rest believed that P1 and P2 were necessary as stated. Mr. Joseph Drelicharz believed that revision was necessary. He justified his position by stating that users generally didn't have the necessary knowledge base to be involved to the extent specified by elements P1 and P2. The other eight respondents addressing elements P1 and P2 considered them to be necessary as stated. An evaluation of the comments applicable to these two elements indicated that both elements were necessary for program success.

All of the respondents addressing elements P3, P4, P5, and P6 were unanimous in their approval. It was found that elements P3, P4, P5, and P6 were necessary for program success.

Table 5.4

Category: Participative Leadership

Summary of Responses To The Interview Question:
Is This Element Necessary For An
Acquisition Program To Be Successful?
(in percentages, eleven respondents)

Code	No Comment %	Not Necessary %	Necessary After Revision %	Necessary %
-----	-----	-----	-----	-----
P1.	18	-	9	73
P2.	27	-	9	64
P3.	27	-	-	73
P4.	36	-	-	64
P5.	36	-	-	64
P6.	45	-	-	55

The answers to investigative question 5b for the elements in the Participative Leadership category are summarized below:

P1. Necessary.

P2. Necessary.

P3. Necessary.

P4. Necessary.

P5. Necessary.

P6. Necessary.

Focus. The responses received to the second interview question for the elements in the Focus category declared the importance and necessity of these elements. The following statements by Colonel Tourino expressed the sentiments of every respondent: 'These are right on. You need to keep the contractor and program office both focused on the heart of the problem' (Tourino, 1988).

The following four subsections discuss and analyze the respondents' comments concerning the necessity of each of the three elements in the Focus category. A subsection is devoted to each element. The results will be summarized in the final subsection. Table 5.5 outlines the findings concerning the necessity of these three elements.

No Bells, Whistles, or Additional Fixes Were Added. Element F1 was unanimously determined to be necessary for program success. Mr. Christie epitomized the group's comments when he stated that this element was

Table 5.5

Category: Focus

Summary of Responses To The Interview Question:
Is This Element Necessary For An
Acquisition Program To Be Successful?
(in percentages, eleven respondents)

Code	No Comment %	Not Necessary %	Necessary After Revision %	Necessary %
-----	-----	-----	-----	-----
F1.	-	-	-	100
F2.	9	-	9	82
F3.	9	-	-	91

excellent and absolutely needed. Mr. Kemp emphasized the importance of evaluating each potential addition to the program to ensure that it was necessary for the program to work, versus just nice to have. Due to the unanimous approval, it was found that element F1 was necessary for program success.

Innovation Restricted to the Original Program Scope. Nine of the ten respondents addressing element F2 believed that it was necessary for program success. The importance of this element was reflected in Colonel Gillogly's statements, 'For a program to be successful, you can't let the baseline be destroyed. This is a very important area' (Gillogly, 1988). Colonel Gillogly was also the respondent who believed that element F2 required modification. His opinion was that innovations should only be dismissed if they violated the baseline. He went on to explain that a baseline was violated only if the schedule had to be extended, or if funds were not available.

Colonel Gillogly's statements were discussed with an experienced program management team member. It was concluded that only innovations within the original program scope could be implemented without violating the baseline. In addition, an overwhelming number of respondents commented that element F2 was necessary. They did not indicate that any modifications or qualifications were needed. Therefore, it was found that element F2 was necessary for program

success as currently stated.

Studies Performed by Support Contractors Limited.

The respondents addressing element F3 were accordant in their approval. Colonel Tourino summarized the opinions of the group when he commented, "It is important to be tough on additional studies" (Tourino, 1988). Mr. Drelicharz reiterated the necessity for this element when he stated that program managers must give support contractors sufficient guidance, and tell them which areas to focus on. Minimal analysis was required. It was found that element F3 was necessary for program success.

Findings. The answers to investigative question 5b for the elements in the Focus category are summarized below:

F1. Necessary.

F2. Necessary.

F3. Necessary.

Contractor and System Monitoring. The range of responses to this category and its composing elements was broad. Seven respondents commented on the current efforts to streamline the DOD acquisition process when they saw this category. The DOD streamlining goals are outlined below to help the reader understand the impact these initial comments had on the subsequent interpretation of the elements in this category. The DOD streamlining goals according to Lt Col

Robert R. Angeli, Course Director for Policy, Defense Systems Management College, follow:

1. Do not over-specify requirements. Specify only those requirements that meet an actual need.
2. Shorten the chain of command from the program manager to the Secretary of Defense and to the Service Acquisition Executive.
3. Do not tell the contractor how they should accomplish the specifications. Let the contractor make his/her own decisions on how best to do it.
4. Get the "boilerplate" clauses out of there. Start at ground zero and add only the clauses that are appropriate.

Of the seven respondents who commented on DOD acquisition streamlining, five did not address the individual elements listed under the Contractor and System Monitoring category. Their comments are epitomized in the following statements: "The best thing to do is to give the contractor the requirement, and then back off. The government needs to take the regulations off of both the program manager's back and the contractor's back" (Christie, 1988). The consensus of these five respondents appeared to be that the elements listed under the Contractor and System Monitoring category were "requirements on the backs of program managers and contractors."

Evaluation of the elements in the Contractor and System Monitoring category revealed that these elements were not within the domain of practices that DOD was attempting to eliminate. Element S1 addressed the need to ensure that the product performed as specified in the contract. Elements S2

and S3 addressed the measures of product performance necessary to facilitate subsequent product evaluation. Element S4 and S5 addressed the need for the program manager to monitor the degree of schedule and performance risk. The conclusion: none of the elements in the Contractor and System Monitoring category were candidates for DOD streamlining.

To reiterate, five of the seven respondents who commented on DOD acquisition streamlining did not specifically evaluate each element. In addition, they appeared to express disapproval of the category as a whole. The other two respondents went on to evaluate each individual element. Their attitudes concerning these elements after evaluation was summarized in Colonel Angeli's statement, "The current push in DOD for streamlining does not really affect any of these items, nor negate the need for them" (Angeli, 1988). Both of these respondents determined that all of the elements in this category were necessary for program success. The confusion and subsequent negative attitude seemed to be caused by the category title.

Further investigation revealed that DOD acquisition personnel interpreted the phrase "contractor monitoring" to mean the regulatory requirements that the streamlining goals were attempting to reduce or to apply on a program by program basis. It was concluded the category title required revision. A new category title, Progress and Performance,

was identified that better described the purpose of elements S1 through S5, and eliminated the potentially misleading phrase. It should be noted that the other respondents, excepting the five respondents discussed in preceding paragraphs, addressed each element individually.

The following subsections discuss and analyze the responses received to the second interview question. A subsection is devoted to each of the five elements in the Contractor and System Monitoring category. The final subsection will synopsize the results. Table 5.6 summarizes the findings concerning element necessity that are applicable to this category. To facilitate this summarization the Uncertain, Possibly Necessary column was added.

Actual Demonstration of Requirement Before Sign-off. The consensus of the respondents addressing element S1 was that it was both important and necessary. Colonel Gillogly summarized the group beliefs when he stated, 'Very important. Definitely worth your time. It is not necessarily micromanagement to hold the contractor responsible' (Gillogly, 1988). He went on to add that when he was a program manager he ensured that every requirement was validated. Mr. Drelicharz agreed that element S1 was necessary, but he also felt compelled to caution that program managers must be sure and look at the whole picture when determining if a requirement has been met or not.

Table 5.6

Category: Contractor and System Monitoring

Summary of Responses To The Interview Question:
Is This Element Necessary For An
Acquisition Program To Be Successful?
(in percentages, eleven respondents)

Code	No Comment %	Not Necessary %	Uncertain, Possibly Necessary %	Necessary After Revision %	Necessary %
S1.	55	-	-	-	45
S2.	45	-	-	-	55
S3.	55	-	-	-	45
S4.	36	-	18	-	45
S5.	45	-	9	-	45

Based on unanimous approval, and cognizant of the cautions, it was found that element S1 was necessary for program success.

Technical Performance Measures Established Up Front. All of the respondents addressing element S2 stated that it was necessary for program success. The following statement by Colonel Tourino epitomized the group comments, "If technical performance measures are not in place at the beginning then the cows are already out of the barn by the time you get the data" (Tourino, 1988). Minimal analysis was required. Element S2 was found to be necessary for program success.

RMA Established Up Front, and Achievable. The respondents addressing element S3 unanimously believed that establishing repairability, maintainability, and availability (RMA) standards in accordance with this element made sense. The following comments emphasized the necessity of element S3: "It is important for the program manager to ensure that RMAs are achievable before they are put down in the contract. If they are not, then the program runs into trouble" (Angeli, 1988). Based on the respondent comments, element S3 was found to be necessary for program success.

All Problems Categorized and Visible in INFO Database. The comments concerning element S4 were all positive. Mr. Drelicharz summarized the group opinion when he stated that element S4 was a good idea to solve an age-

old problem. Two of the respondents were enthusiastic about the element, but were unable to determine if it was necessary for program success. The comments concerning this element were evaluated. Five of the seven respondents who addressed this element determined that it was necessary. The two respondents who were hesitant to make a determination made no negative comments. Therefore, element S4 was found to be necessary for program success.

Numerous Indicators of Program Progress Used. The range of responses to element S5 was limited. Five respondents believed that this element was necessary for program success. Their opinions were epitomized by Colonel Angeli's comment that this element was good because it would help to highlight contradictory information and potential problems. Lt Col Paul Huegel believed that element S5 was interesting and maybe even necessary. He could not state with certainty that this element was necessary for program success. After evaluating the responses, it was found that element S5 was necessary for program success.

Findings. The answers to investigative question 5b for the elements in the Contractor and System Monitoring category are summarized below:

S1. Necessary.

S2. Necessary.

S3. Necessary.

S4. Necessary.

S5. Necessary.

Testing and Training. The group consensus was that both testing and training were essential for program success. The opinions of the ten respondents who addressed the elements in this category are reflected in the following statement by Ms. Darleen Druyun, "A disciplined test process defined up front will increase the chances of program success" (Druyun, 1988).

The responses to the second interview question regarding the elements in the Testing and Training category are discussed and analyzed in the following paragraphs. The results will be synopsized in the last paragraph. Table 5.7 summarizes the findings concerning the necessity of the elements in the Testing and Training category.

There was only one respondent who did not comment on elements A1, A2, and A3. The respondents who did address these elements unanimously believed that elements A1, A2, and A3 were essential for program success. The following statements capsulize the group's sentiments: "You have got to know whether the criteria are met as soon as possible" (Kemp, 1988), "It is important to find problems early, before the program goes over budget and while there is still time to fix them" (Christie, 1988), "Without unstructured testing a program goes into production with faulty software" (Christie, 1988), and "User involvement is absolutely imperative in this area" (Lindenfelser, 1988). The

Table 5.7

Category: Testing and Training

Summary of Responses To The Interview Question:
Is This Element Necessary For An
Acquisition Program To Be Successful?
(in percentages, eleven respondents)

Code	No Comment %	Not Necessary %	Necessary After Revision %	Necessary %
-----	-----	-----	-----	-----
A1.	9	-	-	100
A2.	9	-	-	91
A3.	9	-	-	91
A4.	9	-	9	82
A5.	18	-	-	82

evaluation of responses clearly indicated that elements A1, A2, and A3 were necessary for program success.

Eight of the nine respondents addressing element A4 believed that it was vital for program success. The following statement by Mr. Ira Kemp epitomized their comments, "The most crucial part of any system! Without trained operators and maintenance personnel a system is useless" (Kemp, 1988). Mr. Joseph Drelicharz agreed that element A4 was necessary, but he also believed that it was insufficient. He stated that this element was necessary, but that it should include much more than having personnel trained. He further explained that the site also had to be prepared and ready to support the system before it was delivered.

The evaluation included both the comments received concerning element A4, and the data collected during the case study of the Host computer system. Based on the Host program management team comments, and on the observed detail going into Host site preparations it was concluded that Mr. Drelicharz's suggested modification should be evaluated for addition to the management strategy. It was also found that element A4 was necessary for program success as stated.

All of the respondents addressing element A5 agreed that it was necessary for program success. The following statement by Mr. Drelicharz summarized the group's comments, "Yes, this is needed continuously and forever" (Drelicharz,

1988). Minimal analysis was required. Element A5 was found to be necessary for program success.

The answers to investigative question 5b for the elements in the Testing and Training category are summarized below:

A1. Necessary.

A2. Necessary.

A3. Necessary.

A4. Necessary.

A5. Necessary.

Element Applicability to the DOD Acquisition Process

This section presents the range and general sentiment of the responses received to the second interview question. This information was used to answer investigative questions 5c, 5d, 5e, and 5f. The third interview question concerned only those management strategy elements which the respondent had identified as necessary for program success as stated. For each of the elements categorized as necessary, the respondent was required to determine if that element was currently used, potentially applicable, or not applicable to the DOD acquisition process. The purpose of the investigative questions was to methodically evaluate the elements in the hypothesized management strategy, and to eliminate those that were not necessary for program success and/or not applicable to DOD.

In answering the second interview question addressing element necessity, several elements were found to be necessary after modification, and one element was found to be not necessary for program success. Table 5.8 summarizes the findings to investigative question 5b which provide the basis for further investigation. The one element found to be not necessary did not need to be addressed in this section because it had already been eliminated from the proposed management strategy. In addition, the elements found to require revision did not need to be addressed in this section because the respondents believed that the modified element would be necessary for program success and applicable to the DOD acquisition process. Without modification, the recommending respondents believed that the element would not be necessary for program success, which would eliminate it from the proposed management strategy. This section addresses only those elements listed in Table 5.8 that were found to be necessary for program success.

The respondents primarily focused on addressing element necessity and provided general responses to the third interview question. They specifically addressed only those elements which they believed had limited applicability. The majority of the respondents answered the third interview question with a general comment at the conclusion of the interview. This section is further divided into seven sections. A section is devoted to each of the six

Table 5.8

Summary of Findings to Investigative Question 5b:
Identifying Elements Necessary for Program Success

Element	Finding
-----	-----
Contract:	
C1.	Necessary
C2.	Necessary
C3.	Necessary
C4.	Revision Required
C5.	Revision Required
C6.	Revision Required
Teamwork:	
T1.	Necessary
T2.	Revision Required
T3.	Necessary
T4.	Not Necessary
T5.	Necessary
T6.	Necessary
Participative Leadership:	
P1.	Necessary
P2.	Necessary
P3.	Necessary
P4.	Necessary
P5.	Necessary
P6.	Necessary
Focus:	
F1.	Necessary
F2.	Necessary
F3.	Necessary
Contractor and System Monitoring:	
S1.	Necessary
S2.	Necessary
S3.	Necessary
S4.	Necessary
S5.	Necessary
Testing and Training	
A1.	Necessary
A2.	Necessary
A3.	Necessary
A4.	Necessary
A5.	Necessary

categories in the management strategy. The final section summarizes the concluding comments of the respondents.

Contract. The respondents who determined that the elements C1, C2, and C3 were necessary for program success were unanimous in their findings. They determined that these elements were currently used in DOD, and were applicable to all DOD programs. The following statements by Colonel Huegel summarized their comments:

It is most important to define user requirements through the Statement of Need. It is next most important to set up the contract to facilitate program success. Air Force Systems Command is very proud of their efforts in this area. The Acquisition Strategy Panel and Acquisition Strategy Principles facilitate up front planning for contract type and program management. (Huegel, 1988)

Several of the respondents specifically addressed elements C1, C2, and C3. Their comments added support to the findings that these elements were currently used in DOD and were globally applicable. Concerning element C1, Ms. Darleen Druyun stated that Headquarters AFSC was preparing an Award Fee Guide to increase the combined use of award fees and incentive fees in the Air Force. When addressing element C2 Mr. Ira Kemp commented, "Of course this is applicable. It is always effective to build on the learning curve and have the core team move from site to site" (Kemp, 1988). Colonel Tourino made the following statements concerning element C3, "There has been a revolution at AFSC in the last year. There is a major push for realistic schedules" (Tourino, 1988). In addition, the need to

establish realistic program leadtimes was also identified in AFSC Regulation 550-21.

Teamwork. The range of responses to the third interview question for the elements determined to be necessary for program success was very narrow. The consensus of the respondents was that elements T1, T3, T5, and T6 were currently used in DOD, and were applicable to all DOD programs. The respondents were also very concerned about the current condition of the relationship between the government and contractor. The following statements summarize both the group's beliefs that Teamwork was applicable to DOD, and their concerns:

1. Teamwork makes sense, we hope in DOD that these good leadership techniques are applied. (Angeli, 1988)
2. In DOD the teamwork between the government and the contractor is directly affected by external factors. Every time DOD gets bad publicity, the relationship between the service and the contractor gets strained. (Lindenfelser, 1988)
3. Every day the Air Force and the contractor get further and further away from being a good team. Industry does not want to do business with us because we are perceived as a miserable customer. Industry is also concerned with how the public perceives them. This area is of critical concern. The trend is in the wrong direction. The pentagon is trying to turn this around. (Douglass, 1988)

The need for teamwork was also noted in General Bernard P. Randolph's Commander's Policies. In AFSC Regulation 550-2, Command Goals, he stated, "To be successful, it is essential that we think and act as a team" (Department of the Air Force, 1987e). He went on to add that acquisition

excellence was maintained by fostering productive teamwork. In AFSC Regulation 550-4, Teamwork, General Randolph emphasized that teamwork across the functional boundaries of the procuring government organization was viewed as very important.

The comments of the respondents who specifically addressed elements T1, T3, and T5 are provided below. These comments provided additional support to the findings that the elements of concern were currently used in DOD and were globally applicable. Colonel Tourino made the following statement regarding element T1, "Some program offices don't have time to do this, but this is the better way" (Tourino, 1988). Mr. Kemp added, "Probably a good lesson learned, applicable to the Air Force, but something that DOD usually does not do well" (Kemp, 1988). Concerning element T3, Colonel Huegel summarized the group beliefs when he stated, "The idea of contractor/government team effort has always been promoted at AFSC" (Huegel, 1988). Mr. Drelicharz commented that element T5 was a DOD goal, but qualified his response with the following statement, "In DOD this is a tough thing to do. There are too many special interest groups trying to give the contractor guidance. The program manager must be continually reminding the contractor that these outside groups can't change the agreement already established with the primary contracting officer"

(Drelicharz, 1988). There were no specific examples of element T6 application to DOD programs.

Participative Leadership. All of the elements in this category were determined to be necessary for program success. The respondents were also unanimous in their beliefs that these elements were all currently used in DOD and were applicable to all programs. The respondents made few comments concerning each specific element. In answering the third interview question for each element the respondents used the phrase 'definitely applies' frequently. In addition, their comments concerning the Participative Leadership category made their beliefs clear. Mr. Rak pointed out that DOD involved users and that most Air Force programs assigned a user representative full time to the System Program Office. General Randolph also made his support of participative leadership clear. In AFSC Regulation 550-24, Commander's Policies, Acquisition Team Concept, he stated:

My experience in the acquisition business has shown me conclusively that System Program Offices that have close, informal working relationships with their using command (customers) consistently achieve the best results in the Air Force. (Department of the Air Force, 1987a).

General Randolph further addressed the issue in AFSC Regulation 550-21, Commander's Policies, Acquisition Strategy, where he provided the following additional direction to program managers:

Seek expert advice from wherever necessary to formulate sound strategy. . . . I expect the user, the supporter, Headquarters Air Force, and the Secretariat to be invited to participate. I expect the program directors to develop the best strategy possible and, before strategy decisions are set in concrete, to listen to the advice of the best talent available in an open-minded, communicative manner. (Department of the Air Force, 1987b)

Focus. The consensus among the respondents was that the three elements in the Focus category were vital for program success. The respondents addressing these elements were also unanimous in their determinations that F1, F2, and F3 were currently used in DOD, and were applicable to all programs. When evaluating element F3, one respondent commented that he had never seen the concept written down before, although it was currently applied. General Randolph also addressed this area in his Commander's Policies. In AFSC Regulation 550-22, Program Baseline Management, he stated, "Our ability to establish realistic baselines and to stick to them is a key element of acquisition excellence" (Department of the Air Force, 1987d).

The following comments addressing the specific elements provide additional support to the findings that these elements were currently used in DOD and applicable to all programs. Colonel Huegel made the following statements while evaluating element F1:

Program stability is vital. Headquarters AFSC has taken action to stabilize requirements. Currently Headquarters is pushing to get a single integrated program baseline that the program manager, program executive officer, and service acquisition executive (SAE) sign up to. This will establish commitment and

accountability because no baseline changes will be allowed unless approved the SAE. (Huegel, 1988)

The response to element F2 is epitomized by the comments of Mr. Christie and Mr. Drelicharz who stated that the concept was laudable, but hard to do because so many external organizations could interfere with that program. Concerning element F3, Mr. Drelicharz summarized the group's beliefs regarding this element when he stated, "In DOD it is important to give the support contractors sufficient guidance and to tell them which areas to focus on" (Drelicharz, 1988).

Contractor and System Monitoring. The respondents addressing elements S2, S3, and S4 were unanimous in their responses to the third interview question. These three elements were found to be currently used in DOD, and applicable to all programs. The following statement by Mr. Rak supported these findings, "The degree [of contractor and system monitoring] required depends on the program, but it is essential to every program irregardless of degree" (Rak, 1988). The majority of the respondents specifically addressed each element in response to the third interview question. Representative comments are presented below.

The respondents addressing element S2 found it to be currently used, but also noted that it was hard to accomplish. Colonel Huegel pointed out that a new requirements process called TEMP had been instituted by Headquarters AFSC to assist program managers establish

testing specifics, which include technical performance measures, up front. Colonel Huegel also noted that TEMP would help with accomplishing element S3. Colonel Angeli commented that element S3 was applicable to DOD, but added, "Perhaps DOD has to focus on this area a bit more" (Angeli, 1988). The following statements by Colonel Gillogly epitomizes the group's comments, "The program manager should only promise what good analytical checks of the state-of-the-art technology indicate are achievable. This is especially crucial when procuring aircraft, because the environment is unknown and many judgement calls must be made" (Gillogly, 1988).

When evaluating element S4 the respondents commented that it was a good management technique, but they also noted that it was hard to implement in DOD. These attitudes are summarized by Mr. Christie's comment that the system program office and the user were afraid that the program might be cut if the problems were visible. Colonel Gillogly added support to the finding that element S4 was currently used in DOD when he commented that the Air Force uses a system similar to INFO.

The respondents addressing elements S1 and S5 were dissenting in their answers to the third interview question. One group believed that these elements were applicable to all programs, and the other group believed that these elements were applicable to software intensive programs

only. Colonel Angeli's comments summarized the beliefs that S1 was globally applicable. He stated, "DOD is currently doing this. In the Demonstration/Validation phase of system acquisition there is a new requirement to have a competitive prototype flyoff" (Angeli, 1988). The following comments by Colonel Gillogly countered those made by Colonel Angeli, "In a software intensive program demonstration is possible. In other procurements it is not. Prototyping is nice because it reduces risk, but sometimes "fly before you buy" doesn't work" (Gillogly, 1988). Colonel Gillogly then stated that the Air Force currently had a mechanism to accomplish element S1 called the Critical Design Review, which refers to what Colonel Angeli addressed above. Based on this final comment it was found that element S1 was currently used by DOD, and it was applicable to all programs. The difference between programs would be in how the requirement was demonstrated, not in the need to demonstrate requirements.

Colonel Gillogly believed that element S5 was not necessary for all programs. He stated that the necessity of this element depended on the type of system being procured and on the type of contract. He added that close monitoring was vital for software intensive programs like Host. On the other side of the issue, the other respondents believed that element S5 was applicable to all programs. The following statements by Mr. Drelicharz summarized this group's comments: "I want to see this in every program office and in

the Headquarters staff office. This is important and necessary...' (Drelicharz, 1988). The comments by Colonel Gillogly concerning the limited applicability of this element were evaluated in conjunction with the comments from the other respondents. It was concluded that this element was applicable to all programs. The following statements by Colonel Tourino supported this conclusion, 'It is important for program managers to get their own data and to do their own analysis in parallel [with the contractor's analysis]' (Tourino, 1988). Therefore it was found that element S5 was currently used by DOD, and was applicable to all DOD programs.

Testing and Training. The respondents who determined that the elements in the Testing and Training category were necessary for program success were unanimous in their findings. They determined that these elements were currently used in DOD, and that they were applicable to all DOD programs. The following statements summarized their comments:

1. According to AFSC Acquisition Strategy Principles, a disciplined test process must be defined up front. If it is, the result will be executable test objectives, measurable test criteria, and increased chance of program success. (Druyun, 1988; Office of the Chief of Staff for Contracts, 1988:3)
2. Philosophically these elements are in league with DOD objectives. In actuality, DOD is having a hard time meeting these elements. Testing especially has been under scrutiny. DOD has a testing agency with an independent tester in each service. (Lindenfelser, 1988)

Several of the respondents specifically addressed these elements. Their comments added support to the findings that elements A1, A2, A3, A4, and A5 were currently used in DOD, and that they were applicable to all programs. The responses concerning element A1 are summarized in the following statements by Colonel Angeli, 'Although DOD should do this, and is supposed to do this, it is frequently not done. Both program managers and users are afraid of finding problems, and tend to downplay problems. Colonel Huegel again commented that TEMP, a new requirements process, was being instituted at Headquarters AFSC. He also stressed, 'Headquarters AFSC is currently putting a lot of emphasis on getting an early start on testing' (Huegel, 1988). The findings concerning element A1 were supported by the following directives from General Randolph in his Commander's Policies, 'Program directors will maintain early and continual involvement with the Air Force Operational Test and Evaluation Center...' (Department of the Air Force, 1987c).

The respondents who determined that element A2 was necessary unanimously believed that it was currently used by DOD, and that it was globally applicable. In addition, many of them were compelled to add some words of caution. The following statements summarized the respondent's comments and concerns:

1. The Air Force tries to approach unstructured testing in a more logical method. You can 'crash' a

computer, but you can't crash an airplane. With aircraft the envelope must be expanded gradually. (Kemp, 1988)

2. Currently all DOD programs are required to conduct both development and operational testing. Development testing, done by scientists in a structured lab environment is probably similar to the structured testing conducted for Host. Operational testing is normally done in an operational environment, therefore it may be similar to the unstructured testing conducted for Host. (Angeli, 1988)

3. DOD needs to do a lot more unstructured testing. (Christie, 1988)

The comments addressing element A3 were brief. The phrases 'couldn't agree more' (Gillogly, 1988), and 'definitely needed, and done in DOD' (Angeli, 1988) epitomized the respondent's comments. The following statements by Colonel Gillogly summarized the responses concerning element A4: 'Training is almost always planned for, yet it is not actually done too often. Training before delivery is hard to achieve. The user must keep the old system going and often can't afford to send users off for training' (Gillogly, 1988). The responses to element A5 were capsulized in the comment by Ms. Darleen Druyun that this element was a standard requirement.

Concluding Comments. The respondents who didn't answer the third interview question for each element tended to answer it in the conclusion, addressing the entire management strategy in general. Even the respondents who did provide specific answers tended to revisit this question in the conclusion. Therefore, some of those concluding comments are presented here.

Brig Gen John Douglass commented that all of the elements in the hypothesized management strategy had limited application. His statements are summarized below:

These are all good things to do, especially if you are buying a data processing system. This lends itself well to communications and computer systems type architectures. In general these things are good, but they are not applicable to the entire scope of acquisition in the military today. For example, in automated data processing maybe 50 percent of the resources go into software assurances, with a new aircraft the percentage is much lower. The type of tests being run are also much different. (Douglass, 1988).

General Douglass' comments were evaluated against the comments of the other respondents. The other respondents believed that the elements found to be necessary in the hypothesized management strategy were currently used in DOD and were applicable to the entire scope of DOD programs. The following statements epitomize the comments of most of the respondents:

1. Everything listed here is important. DOD program managers should be attuned to these elements and usually are. (Angeli, 1988)
2. All of the items listed here apply to all DOD acquisition programs. They are all common sense. (Druyun, 1988)
3. There are things that the Air Force has done along these lines, and those things are good, but there is still a long way to go. (Huegel, 1988)
4. DOD currently does something in every category here. What is done depends on the program phase. (Rak, 1988)

When evaluated against the comments of the majority of the respondents, the contention that these elements had a

limited applicability was refuted. In addition, it was countered that these elements specified neither the types of tests to be run, nor the percentage of resources to be devoted to specific elements. If these had been specified, then the applicability of the elements would have been limited. In response to investigative question 5c, all of the elements determined to be necessary for program success in response to investigative question 5b were found to be currently used in DOD. Because all of the elements found to be necessary for program success were currently used in DOD the prerequisite characteristics of the elements to be evaluated by investigative questions 5d and 5e were not met. Therefore, both investigative questions 5d and 5e were not addressed. In response to investigative question 5f, all of the elements determined to be necessary for program success were found to be applicable to all programs.

Elements Suggested for Addition to the Management Strategy

While evaluating the elements in the hypothesized management strategy the respondents identified elements which were missing from the strategy that they believed were necessary for program success. The following statement by Colonel (Ret) Lindenfelser provided additional justification for evaluating the respondents recommendations: "A primary problem with this list of elements identified by the Host

program management team is these elements can all be found in unsuccessful programs too. A successful program has all of these menu items plus a few additional items, especially stability' (Lindenfelser, 1988). The respondents' recommendations are presented and analyzed in the following three sections. The sections correspond to the three management strategy categories from which the recommendations were generated. These three categories are, Contract, Teamwork, and Testing and Training.

Contract. As pointed out by Colonel (Ret) Lindenfelser, a primary concern of the respondents was stability. When addressing element C4 Ms. Druyun pointed out that the allocation and timing of program funds were crucial to program execution, but these were not possible without stability. Colonel Tourino also commented, "What is fundamental to successful major systems acquisition is budget stability" (Tourino, 1988). Colonel (Ret) Lindenfelser identified the three types of stability a program must have: 1) requirements stability, 2) funding stability, and 3) environment stability. The need for requirements stability has already been addressed in the Focus category. According to Colonel (Ret) Lindenfelser, funding stability starts at the service level, and it must include the Office of the Secretary of Defense and Congress. He further explained that environment stability was a result of support through the system to keep the program alive,

including Congressional support. Colonel Angeli also addressed the need for Congressional support, and he presented a few ways of increasing that support.

Mr. Arthur Simolunas, the Host Contracting Officer Technical Representative, was asked if Host had funding stability. He stated that the Federal Aviation Administration had eight billion dollars set aside in a trust fund for the National Aerospace System Plan (NASP) improvement, which Host fell under. Mr. Simolunas stated that the funding stability was very important to Host success. This response indicated that Colonel (Ret) Lindenfelser's suggestions for maintaining budget stability required exploration.

Colonel (Ret) Lindenfelser believed that it was crucial for program managers to understand the resource allocation process. He stated, "Without this understanding the program manager is lost. It is within this process that the program manager can work to maintain funding stability. The program manager has little control over output, but input can be provided" (Lindenfelser, 1988). Therefore it was found that an element requiring funding stability should be added. This element should require the program manager to understand and provide inputs to the resource allocation process. To further improve the budgeting process it was also found that Mr. Christie's suggested addition, that fund

requirements be known and budgeted for up front, be added also.

Mr. Simolunas was asked if Host had environment stability. To that he replied that Congress did not get as involved Department of Transportation programs as with Department of Defense programs. He emphasized that NASP improvement was viewed as vital and necessary by Congress. This lent additional support to the need for Colonel Angeli's suggested method for increasing environment stability.

In his concluding comments Colonel Angeli stated, "One major element that is missing is the need to get congressional support. The program manager must take action to ensure that Congress understands the program. This will help to maintain budget stability, which helps to maintain schedule stability which both make the program manager's job much easier" (Angeli, 1988). Before outlining his strategy, Colonel Angeli cautioned that program managers must always remember to go through the appropriate chain of command, and that they are not allowed to lobby Congress. The actions, recommended by Colonel Angeli, that a program manager can take to obtain congressional support are outlined below:

1. Ensure that the Legislative Affairs (LA) section in the appropriate Service Secretary's Office is kept well informed. Program managers can send program updates and reports to the LA section and request that they be passed on to the appropriate congressional offices and committees.

2. The program manager can arrange to visit with the appropriate congressional staff member or professional military assistant from the House Armed Services Committee through the LA section. The program manager can use this visit to ensure that Congress is informed about the program and its importance.

3. The program manager can request to support the program during the congressional budget hearings.

Based on the comments by Mr. Simolunas, and using Colonel Angeli's recommended actions as a guide, it was found that an element directing program managers to keep Congress informed through official service liaisons should be added to the management strategy. It was also determined that the three new elements recommended for addition did not apply to any of the categories already existing. Therefore a new category was identified that would encompass the basic concepts of these three suggestions. This category will be named Program Stability.

It should also be noted that Mr. Theodore Beckloff, Director, Air Traffic Plans and Requirements Service, stated that budget stability and Congressional support were important, but without the other elements the Host program would have 'fallen on its nose'.

Teamwork. In addressing the elements in teamwork the respondents were concerned that the Host definition of team was too restrictive. The following statement by Colonel (Ret) Lindenfelser emphasized these concerns: 'In DOD the definition of teamwork is very broad. It includes the efforts of the system program office, training command, Air Staff, the Secretariat, the Office of the Secretary of

Defense, Congress, the program manager, the contractor, and the user" (Lindenfelser, 1988). The elements suggested for addition in this area revolved around the expanded team definition.

Colonel (Ret) Lindenfelser stated, "In addition to the other Teamwork elements, the program manager must understand the contractor, their monitoring system, and what is being done in engineering. Any successful program requires this" (Lindenfelser, 1988). This suggestion was evaluated with the elements already recommended in the Teamwork category. The evaluation indicated that, if properly followed, these elements would require the program manager to understand the contractor's systems to the extent necessary to manage the program. Therefore this suggestion was recommended for evaluation in subsequent research, and not included at this time.

When addressing element T2 Mr. Joseph Drelicharz stated, "Communication must be vertical, horizontal, and include the outside chain of command. For example, if you don't have a feel of how the local paper and Congress feel about your program you may be in deep trouble" (Drelicharz, 1988). A similar suggestion to keep Congress informed was already approved for inclusion in the management strategy in the previous section. Therefore, no action was taken.

Mr. Drelicharz also noticed a shortfall when addressing element T3. He stated that it was vital to track action

items generated in meetings. In addition, he stated that it was also vital to have an agenda prepared by the program manager for each meeting. He emphasized that a frequent error in the government was to let the working level or the contractor prepare the agenda. According to Mr. Drelicharz, when the program manager prepares the agenda, the items addressed and the information provided will be what the program manager needs and thinks are important. Colonel Tourino also identified these same shortages. He stated, 'This element [T3] is only good if people are prepared for the meeting, and if action items are tracked' (Tourino, 1988). In analyzing these suggestions the data collected during the exploration of Host was reviewed. It was found that action items were visibly tracked and presented at every meeting observed. It was also noted that action items were entered into the problem database, which the majority of the Host respondents cited as vital to Host success. Finally, Milton Garwood, Host Computer System Planning and Implementation Specialist, stated that an agenda was prepared for all meetings. However, there was no evidence to support the suggestion that agendas should be prepared by program managers. Therefore it was found that these two suggestions should be added to the Teamwork category: 1) Track action items generated in meetings, and 2) Prepare meeting agendas.

Testing and Training. There was only one suggested addition to this category. While addressing element A4 Mr. Drelicharz stated, 'Yes, but this includes much more than having personnel trained. The site must also be prepared and ready to support the system before it is delivered' (Drelicharz, 1988). Based on the interviews with the Host hardware implementation team, and on the data collected while observing site preparations it was found that this suggestion should be added to the Testing and Training category.

Management Strategy For Achieving DOD Program Success

The answers to the investigative questions, and the results of the suggested element evaluations provided the information to achieve the second research objective. This achievement is presented in Tables 5.9, and 5.10. Table 5.9 lists the first three categories in the Management Strategy For Achieving DOD Program Success, and Table 5.10 lists the last four. The elements listed in this table were all found to be necessary for program success, currently used in DOD, and applicable to all programs. Those elements found to require modification are restated as revised. The elements recommended for addition that were found to be necessary for program success are also listed.

Table 5.9

Management Strategy For Achieving
DOD Program Success - First Section

Program Stability

1. Understand and provide inputs to the resource allocation process
2. Fund requirements known and budgeted for up front
3. Keep Congress informed through official service liaisons

Contract

1. Award Fee and Incentive Fee used jointly (CPIF/AF)
2. Waterfall implementation plan
3. Realistic schedule providing some slack
4. Funds budgeted by either user or program office to support participative requirements
5. Requirements generated by the user in terms of operational need
6. Include specific contract provisions to encourage contractor cooperation

Teamwork

1. All constituents involved in planning and scheduling
2. Both lateral and vertical communication channels open
3. Frequent meetings used to resolve differences
4. Track action items generated in meetings
5. Prepare and follow meeting agendas
6. One face to users and management
7. All functions involved in problem resolution

Table 5.10

Management Strategy For Achieving
DOD Program Success - Second Section

Participative Leadership

1. Site representatives involved from start to finish
2. User input requested in all areas and all phases
3. Site input actually used
4. Users kept informed, frequent site briefings and memos
5. Problems solved at the lowest level possible
6. Users allowed to voice disagreements and concerns

Focus

1. No bells, whistles, or additional fixes were added
2. Innovation restricted to the original program scope
3. Studies performed by support contractors limited

Progress and Performance

1. Actual demonstration of requirement before sign-off
2. Technical Performance Measures established up front
3. RMA established up front, and achievable
4. All problems categorized and visible in INFO database
5. Numerous indicators of program progress used

Testing and Training

1. Testing as early in development as possible
2. Both structured and unstructured testing conducted
3. User involved in planning and performing test scenarios
4. Site personnel trained before system delivery
5. Site prepared and ready to support system before delivery
6. After delivery detailed site specific testing conducted

VI. Conclusions and Recommendations

Conclusion

The primary assertion of this thesis was that the exploration of a successful program would reveal management processes that facilitated achieving program success that were not previously recommended in research nor used in DOD program management. The exploratory case study of the Federal Aviation Administration's Host computer program resulted in a management strategy hypothesized to help program managers achieve program success. The Host program was appropriate because it met all of the criteria used to determine program success. The hypothesized management strategy was a composite of the management elements and organizational procedures perceived by the Host program management team to contribute to Host success. The strategy was comprehensive. The six categories encompassed the following:

1. Elements that should be included in the contract to facilitate program management.
2. Elements consistent with current management theory to ensure the cooperation and enthusiasm of the program management team, the user, and the contractor.
3. Elements to keep all efforts focused towards program goals, and to track progress towards those goals.
4. Elements to ensure that the end product is what was originally specified and needed.

Despite the rigour of the methodology and the comprehensiveness of the resulting hypothesized management strategy the answer to investigative question 5a was that no new concepts had been discovered. The conclusion: the primary assertion of this thesis was not met by the exploration of the Host computer program. This is not seen as a wasted effort, however, as it tends to reassure the reader that DOD program management may be somewhat better than feared or than implied by critical assessments. On the contrary, to have found numerous new tools of successful programs not already being used by DOD would have confirmed the lack of successful practices in DOD program management.

Recommendations

The management strategy resulting from the DOD acquisition expert survey, conducted to evaluate the hypothesized strategy formulated during the Host evaluation, was found to be a good guide for achieving program success. The following recommendations were based on the findings of the expert opinion survey. These recommendations are divided into the seven categories contained in the management strategy that resulted from the beliefs and recommendations of the experts interviewed.

Recommendation No. 1. Funding stability, identified as crucial to program execution, is primarily a function of the external program environment. A major finding of the expert opinion survey was the identification of actions that the

program manager could take to increase funding stability.

It is recommended that program managers take the following actions to increase the funding stability of their programs:

1. The program manager must learn how the resource allocation process works, and provide inputs to that process.

2. The program manager must expend the time and resources to accurately identify funding requirements. Those requirements should include consideration for the degree of program risk.

3. The program manager must keep Congress informed of the potential benefit of the program and of program accomplishments. These actions can be accomplished through letters, reports or personal visits and should be coordinated through the official service liaisons to Congress.

Recommendation No. 2. The management of a program can be hindered or facilitated by the structure and elements of the contract. The Host program management team members identified six contract elements that facilitated program management. The DOD acquisition experts validated the necessity of four of those elements, and directed the modification of the other two. It is recommended that the program manager, working in unison with the contracting officer, incorporate the following features into the contract to facilitate the management of the program:

1. Use award fees and incentive fees jointly. Match the share ratio between these two fees to the degree of program risk. Ensure that the award fee percentage is at least equal to the incentive fee percentage.

2. Use a waterfall implementation plan if the program involves several different sites. Apply the lessons learned at one site to subsequent sites.

3. The program manager must expend the time and resources to develop a realistic schedule. The program manager is cautioned not to be optimistic. The schedule must allow a degree of slack commensurate with anticipated program risk.

4. The program manager must ensure that funds are budgeted in either the program budget or in the user's budget to support participative requirements. It is also recommended that DOD investigate routinely including participative requirements in the program budget.

5. The program manager must not 'push' requirements or technology on the user. The program manager must ensure that the requirements submitted by the user are in terms of operational need, and must work jointly with the user in making the tradeoffs between alternatives. The user must be involved in determining if the specifications selected meet its need.

6. The program manager must include specific contract provisions to encourage contractor cooperation. The negative reinforcement of holding the contractors money has a significant impact.

Recommendation No. 3. The factor found to be most important for successful program management by the Defense Systems Management College study examined in Chapter II was a teamwork relationship of mutual trust between government and contractor personnel (Baumgartner, 1984:37). Despite their concerns of possible conflict of interest and a historical lack of cooperation between the government and the contractor, the DOD acquisition experts determined that cooperation was necessary for program success. The importance of cooperation and communication was found to extend to the relationships between the program management team members. It is recommended that the program manager take the following actions to increase teamwork:

1. After the basic baseline is established, the program manager must get all constituents involved in planning and scheduling. The term constituents includes both the government and contractor program personnel. This action facilitates the need to dig in immediately after the contract is awarded and achieve an early meeting of the minds. All constituents learn what is expected from them, and what the program goals are.

2. The program manager must encourage program team members to communicate across functional boundaries and to communicate with their contractor counterparts. In addition to lateral communication, the program manager must emphasize the need for team members to keep him/her informed, and must provide frequent feedback to the team members in return.

3. In addition to formal meetings, the program manager must encourage the use of informal meetings to resolve differences between the government and the contractor as they arise. The program manager must also require that he/she be kept in the loop. This is in line with the idea of a team effort.

4. The program manager must ensure that the action items generated in meetings are tracked. This will increase the productivity of the meeting, and will motivate participants to arrive prepared.

5. The program manager must prepare the agenda for meetings, or provide substantial input to its preparation. This ensures that the information provided in the meeting is what the program manager needs and believes is important.

6. The program manager must take action to ensure that one face is presented to users and management, and must emphasize the importance of this unity. Presenting one face to users increases user confidence and morale. Presenting one face to management increases program credibility. The difficult process necessary to achieve this unity clarifies program direction and goals, and ensures that all team members are on the right track.

7. The program manager must work with the contractor to resolve problems. The degree of cooperation is dependent on the terms of the contract. Cooperation on problem resolution increases the chances of successful program execution.

Recommendation No. 4. The heart of the new management theory, credited with the high productivity and quality

levels achieved by the Japanese and select U.S. firms, was user involvement and participation. The beliefs of the DOD acquisition experts interviewed were corroborated by the findings of the studies evaluated in the literature review. It was found that participative leadership is vital to program success. The following actions are recommended to ensure user involvement:

1. The program manager must involve users in planning, scheduling, and tradeoff evaluation from the beginning of the acquisition life cycle to the end.

2. The program manager must actively seek user input in all phases of the acquisition life cycle, and in all operational areas.

3. The program manager must use the input collected. If the input is not used then many operational considerations will be overlooked, and the users will quickly stop providing feedback and suggestions. Visible application of the user's input will increase user enthusiasm and acceptance of the system. Enthusiasm and acceptance will result in more feedback and user effort, which will contribute to achieving program success.

4. The program manager must keep users informed. Frequent site visits will provide insight to user attitudes and potential system acceptance, and will increase user support and confidence. The program manager must use all means of communication to keep the user updated on program progress, and to educate the user about the system where necessary.

5. The program manager should delegate authority to the program management team members. This delegation should include an emphasis on solving problems at the lowest level possible. This trains and motivates personnel, while freeing the program manager to tackle the major problems.

6. The program manager must allow users and program management team members to voice disagreements and concerns. This is a good early warning device for potential problems.

Recommendation No. 5. Requirements stability was identified by the DOD acquisition experts as DOD's biggest

problem and was identified as a primary factor for achieving program success. The need to focus program efforts was found to be vital, but also hard to accomplish. The following actions are recommended to help the program manager with this goal:

1. The program manager must evaluate each potential addition to the program to ensure that it is necessary for achieving program goals and not just nice to have.
2. The program manager must take care to ensure that innovations do not violate the program baseline or schedule.
3. The program manager must give support contractors sufficient guidance and tell them which areas to focus on in their studies. Additional studies can significantly increase program cost. The program manager must be tough on these additional studies, allowing only those that make a contribution to the program.

Recommendation No. 6. An important factor in meeting program schedule and in gaining user acceptance of the delivered system is monitoring program progress and performance. The DOD acquisition experts validated the necessity of these five elements identified by Host program management team members as necessary for program success. The following actions are recommended to facilitate the monitoring of program progress and performance:

1. The program manager must ensure that the delivered system meets the contract specifications. It is recommended that government program team members be delegated responsibility for specific groups of requirements and held accountable for ensuring that their assigned requirements are met.
2. The program manager must establish the technical performance measures, against which progress and performance will be assessed, up front. It is recommended that technical performance measures be tied to cost performance measures when they are being established.

3. The program manager must also establish repairability, maintainability, and availability (RMA) standards up front. The first step is to use special studies and analysis personnel to establish the minimum RMA numbers required to support the user's need. The second step is for the program manager to get user approval on the minimum RMAs, and to ensure that the numbers are reasonable and achievable. The concept of achievable must be emphasized.

4. The program manager must ensure that problems are recorded, categorized, and visible. It is important to record problems in both factory and operational testing, and to record a problem the first time that it appears. The program manager should allow only the problem originator to categorize the problem as resolved. These actions will verify that the problems identified are fixed, and will ensure maximum lead time for problem resolution.

5. The program manager must collect data and perform analysis in parallel to what the contractor is doing. These prudent management actions will highlight inconsistencies and the areas where questions should be asked. In addition, this is necessary because the system program office deals with different problems and needs different data than the contractor does.

Recommendation No. 7. The need for prototyping and testing was identified to be a feature of most successful programs by the President's Blue Ribbon Commission (President's Commission, 1986b:12). The Commission noted that prototyping and testing would contribute materially to improving cost and schedule estimates. The need for testing and training was also identified by the Host program management team and was verified as necessary during the expert opinion survey. It is recommended that the program manager incorporate the following elements into the program implementation plan:

1. The program manager must begin testing as early in development as possible. Modular testing should be started

as soon as possible to provide maximum lead-time on any problems discovered.

2. The program manager must ensure that both development and operational testing are conducted. Operational testing should begin early in advanced development. Both of these types of testing are necessary.

3. The program manager must involve the user in both planning and performing test scenarios. User input is vital to ensure that an operational consideration is not overlooked.

4. The program manager must ensure that site personnel are trained before system delivery. A system is worthless if there are no trained personnel to use it. Program managers are encouraged to strongly encourage users to send their personnel for training. If the user is unable to send personnel away for training the program manager should consider sending someone out to the site to conduct training.

5. The program manager must ensure that the site is prepared and ready to support the system before delivery. The actions necessary to accomplish this should be outlined in programs plan and schedule. This is vital.

6. The program manager must conduct detailed site specific testing after the system is delivered to ensure that the system performs as required despite site peculiarities.

Areas For Further Research

During the course of this study two primary areas were identified for further research. These two areas are discussed below.

1. The exploratory research methods used in this study investigated a successful acquisition program to develop a management strategy that was hypothesized to help program managers achieve program success. In the next step the hypothesized management strategy was evaluated by experts.

The result was a management strategy that experts believed would help DOD program managers achieve program success. It is still left to provide conclusive evidence as to which elements cause acquisition success. Future research should be conducted to provide conclusive evidence.

2. During the expert interviews several respondents commented that the principles of management for program management were well known throughout DOD and that the real problem was in implementation. Future research should be conducted to develop recommendations to facilitate implementation of the management strategy resulting from this research effort.

Appendix A: Host Computer Program Interviewees

FAA Headquarters, Service Level

Beckloff, Ted R. ATR-100, Air Traffic Plans and Requirements Service Director, 22 July 1988.

FAA Headquarters, Division Level

Perie, Michael E. AAP-200, Manager, System Development Division, 28 September and 22 December 1987.

FAA Headquarters, Branch Level

Fleming, Timothy G. AAT-120, Chief, Information Systems Branch, Automation and Software Division, 23 December 1987.

Garwood, Gail E. ATR-150, Host Computer System Planning and Implementation Specialist, Air Traffic Advanced Automation System Requirements Branch, System Plans and Programs Division, 6 August 1987 through 22 July 1988.

Garwood, Milton D. ATR-150, Host Computer System Planning and Implementation Specialist, Air Traffic Advanced Automation System Requirements Branch, System Plans and Programs Division, 6 August 1987 through 22 July 1988.

Leabo, Don. AAP-210, Host Computer System Hardware/Software Engineer, Advanced Automation Program Office, Host Computer System Branch, Systems Development Division, 16 September 1987 through 22 July 1988.

Manning, Lewis L. ATR-210, Host Computer System Automation Specialist, Air Traffic Advanced Automation Software Requirements Branch, System Plans and Programs Division, 25 September 1987.

Marek, Richard. APM-240, Program Manager, Host Systems Implementation Branch, Air Traffic Control Automation Division, 28 September 1987 and 29 January 1988.

Martin, Preston. AAP-220, Computer Systems Analyst, Area Control Computer Complex Program Branch, Air Traffic Control Advanced Automation Division, 22 December 1987.

Peters, Ronald M. AAP-210, Host Computer System Hardware/Software Engineer, Advanced Automation Program Office, Host Computer System Branch, Systems Development Division, 16 September 1987.

Ravenscroft, Diane. APM-240, Program Analyst, Host Systems Implementation Branch, Air Traffic Control Advanced Automation Division, 28 September 1987.

Rymond, Mike. AAP-210, Host Computer System Hardware/Software Engineer, Advanced Automation Program Office, Host Computer System Branch, Systems Development Division, 23 December 1987.

Sanford, Bennie L. APM-240, General Mechanical Engineer, Host Systems Implementation Branch, Air Traffic Control Automation Division, 28 September 1987 and 22 July 1988.

Simolunas, Arthur A. AAP-210, Contracting Officer Technical Representative and Manager, Host Computer System Branch, Advanced Automation Program Office, Systems Development Division, 22 July 1988.

Strand, Linda R. Contracting Officer, Advanced Automation Branch, Contracts Division, 23 December 1987.

Workman, Carroll. APM-240, General Mechanical Engineer, Host Systems Implementation Branch, Air Traffic Control Automation Division, 28 September 1987 and 22 July 1988.

Young, James R. APM-240, System Implementation Specialist, Host Implementation Branch, Air Traffic Control Automation Division, 28 September 1987.

IBM, National Service Division Level

Morris, William J. Host Program Service Executive, FAA Project Office, National Service Division, Atlantic City NJ, 15 and 16 September 1987.

IBM, Federal Systems Division Level

Beeson, Don. Manager, Host Computer System Field Deployment, FAA Project Office, Atlantic City NJ, 15 & 16 September 1987.

Devlin, Frank. Manager, Host Computer System Physical Planning, FAA Project Office, Atlantic City NJ, 15 & 16 September 1987.

Sweigard, Doug. Host Computer System Repairability
Maintainability and Availability Manager, Host Systems
Engineering, Rockville MD, 25 September 1987.

FAA Regional Level

Holtz, Barton. AGL-435, Supervisor, Automation Engineering,
Great Lakes Region, Des Plaines IL, 16 September 1987.

Lichlyter, James. AGL-550, Air Traffic Host Computer
Program Regional Representative, Enroute Automation,
Plans and Programs Division, Great Lakes Region, Des
Plaines IL, 15 September 1987 through 29 January 1988.

Porter, John. AGL-421, Advanced Automation System
Coordinator, Regional Operational Airway Facilities
Division, Great Lakes Region, Des Plaines IL, 15 and 16
September 1987.

Syed, Rizvi A. AGL-435, Electronics Engineer, Automation
Engineering, Great Lakes Region, Des Plaines IL, 16
September 1987.

Martin Marietta Regional Level

Brown, Keith. Regional Integration Representative,
Indianapolis, 16 September 1987.

FAA Air Route Traffic Control Center Level

Bowman, Andrew. Central Computer Complex Technician,
Central Computer Complex, Airways Facilities Sector,
Indianapolis, 16 September 1987.

Burks, Thomas M. Assistant Manager, Airway Facilities
Sector, Indianapolis, 16 September 1987.

Appendix B: Host Computer Program, Events Observed

Second Site Survey - 15 & 16 September 1987
Indianapolis Air Route Traffic Control Center

EVENT 1: FAA Host Computer System Information Briefing

PURPOSE: To provide general information to the users located at the Indianapolis ARTCC. The following items were covered: 1) Host benefits, 2) contract administration, 3) FAA Headquarters program management team points of contact, and 4) the user's role in Host implementation.

PRESENTERS: Milton Garwood, Host Computer System Planning and Implementation Specialist
Don Leabo, Host Computer System Hardware/Software Engineer

PARTICIPANTS: Local Integration Contractor
IBM Nation Service Division
IBM Federal Service Division
FAA Headquarters Program Management Team
FAA Regional Air Traffic
FAA Regional Airway Facilities
Indianapolis ARTCC Air Traffic
Indianapolis ARTCC Airway Facilities

EVENT 2: Informal Meeting

PURPOSE: To resolve site implementation problems.

PARTICIPANTS: Air Traffic Program Management Team Specialist, FAA Headquarters
Air Traffic Host Computer Program Regional Representative
Airway Facilities Advanced Automation System Coordinator

EVENT 3: IBM Host Computer System Deployment and Maintenance Briefing

PURPOSE: To present the findings of the walk-thru assessment of site preparations for Host hardware delivery. The following items were presented: 1) delivery schedule, 2) installation schedule, 3) testing procedures, 4) action item review and additions, and 5) support requirements, the user's role.

PARTICIPANTS: The same as those for Event 1.

Informal, Impromptu Meeting - 25 September 1987
FAA Headquarters, Washington DC

PURPOSE: To discuss the proposed change in ARTCC computer technician staffing. Alternatives to counter the negative effects of the change were addressed.

PARTICIPANTS: Gail Garwood, Host Computer Planning and Implementation Specialist
Lewis Manning, Host Computer System Automation Specialist

Additional Host Tasks Meeting - 25 September 1987
IBM Headquarters, Rockville MD

PURPOSE: To plan for the contract conclusion, and to assess areas to apply excess program funds.

PARTICIPANTS: FAA Headquarters Program Office
FAA Contracting Officer Technical Representative
IBM Program Manager
IBM Federal Systems Division Representatives

Weekly Problem Resolution Telephone Conference
28 September 1987
FAA Headquarters, Washington DC

PURPOSE: To discuss any problems relating to the Host computer system. The following items are addressed: 1) actions being taken to solve problems, 2) problem status, and 3) comments and questions.

PARTICIPANTS: All twenty ARTCCs represented
All Regions represented
FAA Technical Center
FAA Academy
FAA Headquarters Program Office

Appendix C: DOD Expert Interview
Request for Interview Letter

Name
Position
Address

Date

Dear Name

The Air Force Institute of Technology conducts resident graduate educational and research programs in the areas of acquisition, logistics and management. As part of the program requirements, students conduct research on a question of interest to a specific service, or to the DOD in whole. The research findings are subsequently reported in a thesis.

One of our students, 1st Lt Barbara J. Cohen, is conducting a study in the area of program management. Using a methodology similar to that of the Packard Commission, she is attempting to identify which principles used in non-DOD program management might prove useful in DOD program management. Her rigorous investigation of one particularly successful program managed by the Federal Aviation Administration (FAA) indicates that the FAA program applied some innovative techniques which might be applicable within DOD. Part of the methodology we are using calls for acquisition experts to assist in evaluating these 'lessons learned' and their potential applicability. We would like you to be one of these experts.

Lieutenant Cohen would greatly appreciate the opportunity to interview you briefly for this research. Due to academic (class) constraints, she will have only one two-week period for conducting these interviews. Could you possibly spare time for a short (30-45 minutes) interview during the last week of June or the first week of July?

Please have your secretary advise Lieutenant Cohen (Autovon 785-4149 or 513-255-4149) as to when an interview can be scheduled during this period. Her research will be greatly enhanced by your contribution. Thank you in advance for your participation.

GARY L. DELANEY
Chief, Defense Resources Division
System Acquisition Management Dept
School of Systems and Logistics
Air Force Institute of Technology

1 Atch
Host Program Fact
Sheet

Appendix D: DOD Expert Interview
Host Program Fact Sheet

The Host Computer System developed by IBM is one of the first installments of the FAA multi-billion dollar plan to modernize the National Airspace System (NAS). Host will serve as the backbone processor for the new Initial Sector Suite System until replacement by Advanced Automation Processors in the mid-1990s. IBM won this \$197 million contract in July 1985.

Host replaces the 20-year-old IBM 9020 computers currently in the nation's 20 Air Route Traffic Control Centers (ARTCC). The new IBM mainframe computers are ten times faster and have five times the storage capacity. This replacement involves minimal changes to existing National Airspace System (NAS) software. Total NAS software has more than two million lines of code, and Host has 130,000 lines of new or modified NAS code. According to FAA Administrator Donald D. Engen, "[Host] will allow the air traffic control system to keep pace with projected traffic growth over the next decade and accommodate the introduction of new automation functions that will both enhance safety and increase controller productivity." Host features include increased capacity, improved reliability, faster response time, and greater on-line availability.

According to James G. Cain, Deputy Director of the Advanced Automation Program Office, "the Host program has been one of the most successful technical efforts in FAA history. Beginning with the first delivery to the Seattle center in November 1986, the FAA-IBM team has met or surpassed every major program milestone."

Evidence of Host Success

1. Every control center has accepted the system. This is a direct measure of user confidence. In the past some systems have been sent back. With Host, sites have been requesting permission to drop some preliminary tests and accept early.
2. Every control center is using the system after acceptance. It is up to a site manager whether to use a new system or not. There are currently some devices on location that site managers refuse to use.
3. Host is ahead of, or meeting the implementation schedule in all areas.
4. All reliability, maintainability and availability (RMA) and technical performance measurements (TPM) are met or exceeded. This is documented in test results.
5. Control centers have requested that the old system be disconnected 60 days early.
6. Host came in under budget.

Appendix E: DOD Expert Interview
Interview Session Organization

REVIEW PURPOSE OF INTERVIEW

Purpose.

Sponsor.

Methodology, similar to the Packard Commission.

Studied the program management techniques of a successful non-DOD program to see if the techniques/principles they used might apply to DOD program management. Studied the Host Computer System program managed by the FAA.

If you are willing, I'd like to share with you some of the reasons why the Host program management team perceived that they were successful, and use your expert perception to determine if there is any thing new or potentially applicable to the way we manage DOD programs.

Clarify if necessary. Asking to bounce ideas off of the expert, not asking them to be creative.

PROVIDED ANY BACKGROUND WANTED/NEEDED

REVIEW 5 MAIN CATEGORIES FOR HOST SUCCESS

Hand respondent the "Reasons for Host Success." (The "Reasons for Host Success" given to each respondent is contained in Appendix F.)

The reasons given for the Host program success fell into five major areas. This paper shows those five areas and the supporting reasons within each.

I'll give you a few minutes to review this list. After you have completed your review, I will answer any questions you may have, discuss each area, and ask for your opinion as to the usefulness/applicability of each element.

INTRODUCTION FOR EACH CATEGORY

Contract.

Host acquisition success began when an environment conducive to program management was established in the contract and statement of work (SOW).

Teamwork.

Everyone interviewed cited teamwork as a major element in the success of the Host program. The Host team included the FAA program management team members, and their IBM counterparts. Included in the teamwork category is sufficient authority and freedom given to each team member to carry out assigned responsibilities.

Participative Leadership.

Everyone interviewed believed that it is necessary to involve the user. To bring in the people who need and will use the system. The field personnel were treated as experts, and their expertise was used. This focus on the needs of the user increased user morale and resulted in enthusiastic user support, effort, and suggestions.

Focus.

The Advanced Automation Division manager and system engineers emphasized and reemphasized the need to "rein people in." They cited "focus" as a primary reason for Host coming in ahead of schedule and under budget. This focus was also believed to contribute to teamwork because team members could focus on the program instead of continually focusing on changes.

Contractor and System Monitoring.

This category was viewed as vital to ensuring that Host remained "on track." This was partially accomplished by listing the primary contractor program management requirements, and formal/informal meeting support requirements in the SOW. In addition, the FAA team carefully monitored program progress using indicators which were independent of the contractor's. Attention to detail was a key concept.

Testing and Training.

All of the other elements must be in line for successful testing and training. Teamwork between the FAA program management team and their IBM counterparts was believed to be vital to productive testing. The testing requirements outlined in the contract must be flexible because there is insufficient information when the contract is drafted to determine all of the testing that must be done. Flexibility allows specific testing requirements to change as additional information is gathered.

Participative leadership with the resulting user enthusiasm, confidence and trust was viewed as vital to successful training. Users must be involved in testing and training if they are to be confident in the system, and have the confidence in themselves to use the system once it is installed. All interviewees believed that these elements were vital to achieving the final measures of success, 1. user acceptance and 2. actual use of the new system.

QUESTIONS TO ASK FOR EACH ELEMENT

1. Is this element new or unique to DOD program management?

2. Is this element necessary for an acquisition program to be successful?

2a. If no, ask "Why?" DONE, go to next element.

2b. If yes, continue with questions.

3. Is this element currently used or potentially applicable to the DOD acquisition process?

3a. If no, ask "Why?" DONE, go to next element.

3b. If currently used, DONE, go to next element.

3c. If potentially applicable, ask "What is the range of programs that this element is applicable to?" Continue with questions.

4. What must be done before this element can be implemented?

VERIFY/FILL IN NOTES TAKEN

Clarify notes with respondent.

Check that main points were noted.

Verify bibliography information.

FOLLOW-UP & USE OF INTERVIEW

Inform respondent that a paraphrase of the interview will be sent in 5 to 7 days for him/her to review and annotate as necessary.

Ask respondent for permission to include the annotated paraphrase in an appendix to the thesis, and to draw quotes from it for the analysis of the interviews.

THANK THEM

Appendix F: DOD Expert Interview
Reasons For Host Success

Contract:

- Award Fee and Incentive Fee used jointly (CPIF/AF)
- Waterfall implementation plan
- Realistic schedule providing some slack
- Funds budgeted to support participative requirements
- Detailed requirements generated by the user
- Problem resolution impacts contractor payment schedule

Teamwork:

- All constituents involved in planning and scheduling
- Lateral communication channels open
- Frequent meetings used to resolve differences
- Responsibilities accepted, not assigned
- One face to users and management
- All functions involved in problem resolution

Participative Leadership:

- Site representatives involved from start to finish
- User input requested in all areas and all phases
- Site input actually used
- Users kept informed, frequent site briefings and memos
- Problems solved at the lowest level possible
- Users allowed to voice disagreements and concerns

Focus:

- No bells, whistles, or additional fixes were added
- Innovation restricted to the original program scope
- Studies performed by support contractors limited

Contractor and System Monitoring:

- Actual demonstration of requirement before sign-off
- Technical Performance Measures established up front
- RMA established up front, and achievable
- All problems categorized and visible in INFO database
- Numerous indicators of program progress used

Testing and Training:

- Testing as early in development as possible
- Both structured and unstructured testing conducted
- User involved in planning and performing test scenarios
- Site personnel trained before system delivery
- After delivery detailed site specific testing conducted

Appendix G: DOD Expert Interview
Thank You, Request for Review Letter

Name
Position
Address

Date

Dear Name

Thank you for your time and for the opportunity to interview you. Your perceptions and comments were very helpful.

I would like your permission to include a brief outline of the interview in an appendix to my thesis. I am enclosing a paraphrase of your comments for each of the program management categories which we discussed. This is a preliminary draft, please feel free to make additional comments or clarifying adjustments directly on it. The final appendix inclusion will be more concise than this draft, and will reflect all changes.

Included for your reference are the Host Fact Sheet, and the Reasons For Host Success as perceived by the Host program management team.

Please return the annotated draft in the enclosed envelope. If no adjustments are required then no further action is necessary, although I would appreciate a quick note stating such. Again, thank you for your interest in this project.

BARBARA J. COHEN, 1Lt, USAF
Graduate Student
School of Systems and Logistics
Air Force Institute of Technology

4 Atch
1. Interview Paraphrase
2. Host Fact Sheet
3. Host Menu For Success
4. Address

Appendix H: DOD Expert Interviews
Paraphrase of Each Interview

NAME: Lt Col Robert R. Angeli (USA)

TITLE: Course Director for Policy
Defense Systems Management College
DSMC/SE-P
Ft Belvoir, VA 22060-5426

DATE: 7 July 88

TIME: 1000

PLACE: DSMC, Ft Belvoir

CONTRACT

Award Fee and Incentive Fee used jointly (CPIF/AF).

Waterfall implementation plan.

Realistic schedule providing some slack.

Funds budgeted to support participative requirements.
The user pays their own TDYs in DOD. To put TDY funds to support user participation in the program budget would attract some attention.

Detailed requirements generated by the user. I have always felt that the requirements came from the user in the form of a statement of need.

Problem resolution impacts contractor payment schedule.

TEAMWORK

Teamwork makes sense. We hope in DOD that these good leadership techniques are applied.

All constituents involved in planning and scheduling.
Yes. Some program offices may not have time to do this, but this is the better way of doing things.

Lateral communication channels open. Yes, this is important.

Frequent meetings used to resolve differences. Yes.
It is especially important to have an agenda for each meeting.

Responsibilities accepted, not assigned. The less authoritative method of trying to "sell" the task may be a better idea. This makes a lot of sense. The problem is that too many times issues are too "hot" to take the time necessary to do this. A lot of folks don't like this idea in DOD, because DOD tends to be a lot more authoritative. The concept here is one currently being taught at DSMC.

One face to users and management. This is a good idea, don't breach the ethical bounds though. Danger, maintain the arm's length. This principle should be applied one step further to include speaking with one voice to Congress.

All functions involved in problem resolution.

PARTICIPATIVE LEADERSHIP

These are necessary. Should be considered beyond the user to include the members of the SPO. These are all just good leadership techniques, especially for an office environment.

Site representatives involved from start to finish.

User input requested in all areas and all phases.

Site input actually used.

Users kept informed, frequent site briefings and memos.

Problems solved at the lowest level possible.

Users allowed to voice disagreements and concerns.

FOCUS

All of these are important. DOD's biggest problem is requirements stability.

No bells, whistles, or additional fixes were added.
Yes. It is also important not to let the user change the basic need.

Innovation restricted to the original problem scope.
Yes.

Studies performed by support contractors limited. Yes.

CONTRACTOR AND SYSTEM MONITORING

The current push in DOD for streamlining doesn't really affect any of these items, or negate the need for them. In DOD the streamlining goals include:

1. Don't over-specify requirements. Specify only those requirements that meet an actual need.
2. Shorten the chain of command from the PM to the Secretary of Defense, the SAE.
3. Don't tell the contractor how they should accomplish the specifications. Let the contractor make their own decisions on how best to do it.
4. Get the 'boilerplate' clauses out of there. Start at ground zero, adding only the clauses that are appropriate.

Actual demonstration of requirement before sign-off.
This sounds reasonable. DOD is currently doing this. In the Demonstration/Validation phase there is a new requirement to have a competitive prototype flyoff.

Technical Performance Measures established up front.
Yes, this makes sense.

RMA established up front, and achievable. Yes, this makes sense. In DOD the acronym is RAM. Achievable is a good point. It is important for the PM to ensure that these numbers are achievable before they are put down in the contract. If RAM are not achievable, then the PM runs into problems. It is also important to involve the user.

Perhaps DOD has to focus on this area a bit more. I am not sure if DOD does a good job in establishing these.

All problems categorized and visible in INFO database.
This should be done. Maybe we aren't doing this in DOD. You would need to talk with someone from ASD to be sure.

Numerous indicators of program progress used. Good.
This would help to highlight contradictory information, and potential problems.

TESTING AND TRAINING

Testing as early in development as possible. Yes. If the PM can't test a full-up system, then they should test the components. This is a very true and important element. Development testing especially needs to be started early. Although DOD should do this, and is supposed to do this it is frequently not done. Both PMs and users are afraid of finding problems, and tend to downplay problems.

Both structured and unstructured testing conducted.
This is an interesting point. Currently all DOD programs are required to conduct both development and operational testing. Development testing, done by scientists in a structured lab environment, is probably similar to the structured testing conducted for Host. Operational testing is normally done in an operational environment, therefore it

may be similar to the unstructured testing conducted for Host. In operational testing, the user is given the piece of equipment to use. This normally occurs before the Production/Deployment phase.

User involved in planning and performing test scenarios. Definitely needed, and done in DOD.

Site personnel trained before system delivery. Definitely needed, DOD is trying to do this.

After delivery, detailed site specific testing conducted. Yes, this is necessary.

CONCLUSION

Everything listed here is important. DOD program managers should be attuned to these elements, and usually are. The primary problem is that these elements can be difficult to follow because of the environment surrounding DOD acquisitions, outside of the program manager's control. The program manager must always be balancing cost, schedule and performance.

One major element that is missing is the need to get congressional support. The PM must take action to ensure that Congress understands the program. This will help to maintain budget stability, which helps to maintain schedule stability which both make the PM's management job much easier.

A word of caution: DOD personnel, therefore PMs, are not allowed to lobby Congress. The PM must go through the Legislative Affairs (LA) section in the appropriate service Secretary's office. The personnel in the LA section are the official service liaisons to Congress. The PM must always remember to go through the appropriate chain of command. Some examples of actions that a PM can take to obtain Congressional support follow:

1. Ensure that the LA section is kept well informed. The PM can send program updates and reports to the LA section and request that they be passed on to the appropriate Congressional offices and committees.

2. The PM can arrange to visit with the appropriate Congressional staff member or professional military assistant from the House Armed Services Committee through the LA section. The PM can use this visit to ensure that Congress is informed about the program and its importance.

3. The PM can request to support the program during the Congressional budget hearings.

NAME: Mr. Thomas P. Christie

TITLE: Director
Directorate (Program Integration)
Under Secretary of Defense Acquisition
The Pentagon
Washington, D.C. 20330

DATE: 6 July 88

TIME: 1330

PLACE: The Pentagon

CONTRACT

Award Fee and Incentive Fee used jointly (CPIF/AF).

Waterfall implementation plan.

Realistic schedule providing some slack. Yes, a realistic schedule is necessary.

Funds budgeted to support participative requirements.
Yes, but more is required in addition to this. It is imperative that fund requirements are known and budgeted for up front. The entire budget must be realistic.

Detailed requirements generated by the user. Too often we are reaching for the moon with requirements in the name of the user. The user becomes a parrot. What is needed is some realism up front. What is needed in the very beginning are requirements that are technically possible, realistic, and feasible.

Problem resolution impacts contractor payment schedule.

TEAMWORK

The relationship between the government and the contractor has been damaged, currently each side views the other as an adversary. The government must stop operating with the attitude that contractors are fleecing us. Efforts are being made to repair the damage. We are trying to change government attitudes, to consider industry as a partner. But the damage will never be repaired as long as Congress and the Secretary of Defense continue "industry bashing."

All constituents involved in planning and scheduling.
This is a given.

Lateral communication channels open.

Frequent meetings used to resolve differences.

Responsibilities accepted, not assigned.

One face to users and management.

All functions involved in problem resolution.

PARTICIPATIVE LEADERSHIP

Site representatives involved from start to finish.

User input requested in all areas and all phases.

Site input actually used.

Users kept informed, frequent site briefings and memos.

Problems solved at the lowest level possible.

Users allowed to voice disagreements and concerns.

FOCUS

No bells, whistles, or additional fixes were added.
Excellent, this is absolutely needed.

Innovation restricted to the original problem scope.
Yes, this is important. It is also hard to do because so many layers can interfere with the program.

Studies performed by support contractors limited. Yes

CONTRACTOR AND SYSTEM MONITORING

The best thing to do is to give the contractor the requirement, and then back off. Let the contractor do whatever is necessary to achieve that requirement.

The government needs to take the regulations off both the PM's back, and the contractor's back. Will we ever see it? The Under Secretary of Defense Acquisition is trying, for example the Enterprise Program was established, but there have been many setbacks.

Actual demonstration of requirement before sign-off.

Technical Performance Measures established up front.

PMA established up front, and achievable.

All problems categorized and visible in INFO database.
For Host this was probably necessary, it might be hard to do in DOD. In addition, the SPO and the user often cover up

problems because they are afraid that the program may be cut, or because the contractor gets them to believe that the problem can and will be easily fixed. This is a very political issue.

Numerous indicators of program progress used.

TESTING AND TRAINING

Testing as early in development as possible. This is a very important point. Too often the program is a long way into the acquisition life cycle before there is any indication of actual item performance. It is important to find problems early, before the program gets over budget, and while there is sufficient time to fix them.

Both structured and unstructured testing conducted. Yes. Unstructured tests are very important, but they are not often done. Without unstructured tests a program often goes into production with "faulty" software. DOD needs to do a lot more unstructured testing.

User involved in planning and performing test scenarios. Yes, both structured and unstructured testing needs to be done in the hands of the operators.

Site personnel trained before system delivery. Yes.

After delivery, detailed site specific testing conducted. Yes.

CONCLUSION

I agree that all of these areas are important. All of the points under testing are necessary, all of the elements under focus are very important, a schedule providing some slack is vital, and it is also important to make sure that fund requirements are known and budgeted for up front.

NAME: Brig Gen John W. Douglass

TITLE: Director
Directorate of Program Planning and Integration
SAF/AQX
The Pentagon
Washington, D.C. 20330

DATE: 29 June 1988

TIME: 1100

PLACE: Pentagon

CONTRACT

Award Fee and Incentive Fee used jointly (CPIF/AF).

Waterfall implementation plan.

Realistic schedule providing some slack.

Funds budgeted to support participative requirements.

Detailed requirements generated by the user.

Problem resolution impacts contractor payment schedule.

TEAMWORK

This is a lost art in the USAF due to Fraud Waste & Abuse witch-hunts. Poor publicity leads to poor public perception of the government and contractors alike. DOD focuses on excessive "tail covering." All of these factors contribute to the broadening gap.

Every day the Air Force and the contractor get further and further away from being a good team. Industry does not want to do business with us because we are perceived as a miserable customer. Industry is also concerned with how the public perceives them. This area is of critical concern. The trend is in the wrong direction. The DOD and contractors are being pushed apart because the military is under assault. The Pentagon is trying to turn this around.

All constituents involved in planning and scheduling.

Lateral communication channels open.

Frequent meetings used to resolve differences.

Responsibilities accepted, not assigned.

One face to users and management.

All functions involved in problem resolution.

PARTICIPATIVE LEADERSHIP

Site representatives involved from start to finish.

User input requested in all areas and all phases.

Site input actually used.

Users kept informed, frequent site briefings and memos.

Problems solved at the lowest level possible.

Users allowed to voice disagreements and concerns.

FOCUS

Focus is needed. You must be tough in ferreting out the bells and whistles from the program.

No bells, whistles, or additional fixes were added.

Innovation restricted to the original problem scope.

Studies performed by support contractors limited.

CONTRACTOR AND SYSTEM MONITORING

There is the dilemma of standardized versus individually tailored contractor monitoring procedures. In the Defense Enterprise Program each program is being tailored differently. In this program the Air Force is stripping the regulatory requirements to tailor the degree of regulation to program risk. This program is expected to expand.

The problem, if everyone is tailoring, how do you apply a regulation? The challenge will be to review the individual programs under Enterprise, and to identify regulations being uniformly eliminated.

Another new program is Flexible Oversight. If the contractor has a plant that is running well with good quality then we [the government] will pull out. On the other hand, if performance degradation occurs the government will crawl in with the contractor. The expected result is that poor contractors will fix the defects, and that good contractors will have reduced cost, possibly higher profit, because less oversight is required.

The bottom line, "You have to take risk." You can't be scared away from contractors. A contractor database is a noble goal, and possibly a good system, but it is a better system to take drastic action against any contractor you see

cheating. Be tough with the bad contractors, make them pay. Don't penalize all contractors.

Actual demonstration of requirement before sign-off.

Technical Performance Measures established up front.

RMA established up front, and achievable.

All problems categorized and visible in INFO database.

Numerous indicators of program progress used.

TESTING AND TRAINING

Testing as early in development as possible.

Both structured and unstructured testing conducted.

User involved in planning and performing test scenarios.

Site personnel trained before system delivery.

After delivery, detailed site specific testing conducted.

CONCLUSION

These are all good things to do, especially if you are buying a data processing system. This lends itself well to ESD, EDP thru 700 series regs, and communications type acquisitions. In general these are good, but they are not applicable to the entire scope of acquisition in the military today.

If you are buying a new aircraft all of these things are important, but they are not important in the same kinds of ways. For example, in EDP maybe 50% of the resources go into software assurances, with a new aircraft the percentage is much lower. The type of tests being run are also much different. The environment is much different. The variability of human error has a different impact.

There is no single model perfect for all acquisitions. You must have flexibility to match the acquisition strategy to the specific program. Yet you must not do unproductive things, you must challenge and get rid of unproductive regulations.

NAME: Mr. Joseph Drelicharz

TITLE: Professor of Engineering Management
Defense Systems Management College
DSMC/PMC-S
Ft Belvoir, VA 22060-5426

DATE: 6 July 88

TIME: 1000

PLACE: DSMC, Ft Belvoir

CONTRACT

Award Fee and Incentive Fee used jointly (CPIF/AF). In the classroom award fees are being touted, and instructors are shying away from incentive fees. Personally, I am very afraid of award fees because they have a tendency to become personal service contracts.

Waterfall implementation plan. This is necessary, and currently a standard procedure. It is the normal deployment plan to pass on lessons learned.

Realistic schedule providing some slack. This is necessary and true, but it is an unrealistic thing to do. It is unrealistic because managers are graded by schedule, causing them to be optimistic and go with a tight schedule. Even if a manager submits a realistic schedule to begin with, as the schedule goes up the chain of command for approval each level trims off its percentage, and an overly optimistic schedule is still the result.

For a program manager, meeting schedule is first priority, making contract cost and actual performance second priority. Schedule drives everything.

Funds budgeted to support participative requirements. Disagree. It is neither wrong nor bad for users to fund their own TDYs to support the project. After all, who is the project for? The user's willingness to do this is a good measure of user desire and interest. A prudent PM would also have funds available for users who truly can not afford to fund their own TDYs.

Detailed requirements generated by the user. No, definitely not. The user does not necessarily have the knowledge and information to define the requirements for high technology and "black box" systems. The requirements generation must be a joint process between the SPO and the user to be realistic.

Problem resolution impacts contractor payment schedule. Careful, this could take away the contractor's motivation.

From the contractor's point of view, "all of these safeguards! Don't you trust me! Aren't we a team?" Perhaps a better way to handle this is to include it in the award fee somehow instead of a separate element in the contract.

TEAMWORK

All constituents involved in planning and scheduling. Detailed scheduling and planning done jointly is good. But, the basic baseline must already be nailed in the contract, and serve as the base for the scheduling and planning.

Lateral communication channels open. This statement is inadequate. Communication must be vertical, lateral, and include the outside chain of command. For example, if you don't have a feel of how the local paper and Congress feel about your program you may be in deep trouble. If you do, you may be able to avoid trouble.

The SPO members should call their contractor counterparts daily, and work in unison.

Frequent meetings used to resolve differences. Maybe frequent is not a good idea. For every monthly informal review session the contractor might spend three weeks preparing, and he's going to use his best people. It is vital to track action items generated in the meeting. It is also vital to go to the meeting prepared. A frequent error in the government is to let the working level or the contractor prepare the agenda. The agenda should be prepared by the PM and coordinated with the contractor. When the PM prepares the agenda, the items addressed and the information provided are what the PM thinks are important and needs.

Responsibilities accepted, not assigned. The Air Force is also a matrixed operation. The Air Force must do both. Sometimes it is better to assign responsibilities, and sometimes it isn't. It depends on the individuals, projects, position in the acquisition cycle, etc.

One face to users and management. Vital to program success. In DOD this is a tough thing to do. There are too many "special interest" groups "flying" out to the contractor and giving the contractor guidance. The program manager must be continually reminding the contractor that these special interest groups can not change the agreement already established between the PM, contracting officer and the contractor.

All functions involved in problem resolution. Definitely. The contractor's problems are our problems.

This is the only way that it will work. But remember, both sides must be compensated for their contributions.

PARTICIPATIVE LEADERSHIP

Some participative leadership is necessary, but these are overstated.

Site representatives involved from start to finish. I don't want the user involved to this extent, the user does not have the necessary knowledge base. The statement of need must be generated by the user, but the PM must decide "how to get there from here." I recommend that the user be involved only in operational considerations, need definition, testing, and implementation.

User input requested in all areas and all phases. No, not in all areas, only in operational areas. I agree that the user should provide input in all phases of the program acquisition life cycle.

Site input actually used. Yes, this is necessary to the best extent possible.

Users kept informed, frequent site briefings and memos. Yes, as much as the user cares to be kept informed.

Problems solved at the lowest level possible. Of course this is important.

Users allowed to voice disagreements and concerns. Yes. The whole problem is to negotiate.

FOCUS

No bells, whistles, or additional fixes were added. Agree, as long as this does not mean shutting off all inputs to requirements. Everyone gets smarter as the development process progresses, and the requirements must still be open to these inputs. Of course the inputs and changes should narrow down the closer the program gets to production, and the baseline should get stiffer.

The primary problem with this is that new RDT&E programs take 10 to 15 years to procure. If the baseline is firmed up too early, then we will end up with a system composed of technology that is 20 years old.

Using common sense is the best guidance for this area.

Innovation restricted to the original problem scope. This is really an affordability issue. A laudable approach, but the scope of most DOD programs will cover the moon. For example, the scope of some programs limits the system to

'air breathing' devices. 'Air breathing' includes fighters, bombers and missiles.

Studies performed by support contractors limited.

Agree. It is important to give the support contractors sufficient guidance, and to tell them which areas to focus on. Studies are generally most appropriate very early or very late in the program.

CONTRACTOR AND SYSTEM MONITORING

Actual demonstration of requirement before sign-off.

You have to look at the whole picture when determining if a requirement has been met. For example, if an aircraft has a requirement to be able to travel at mach .8 and only achieves .79 during the demonstration do you sign the requirement off?

Technical Performance Measures established up front.

This is a good thing to do, but is also very hard to do. The cost to achieve the desired technical performance measures must be considered before they are established. They must also be tied to cost performance measures.

RMA established up front, and achievable.

Agree. It is important to run studies up front to see what RMAs are necessary for the item to be effective. The main point: usually the wrong people establish RMAs. RMAs should be established by special studies and analysis personnel using wargames models. The special studies should be used to establish the minimum RMA numbers required to support the user's need. The PM's duty is to get user approval on the minimum RMAs, and to ensure that the numbers are reasonable and achievable. Often the RMAs are increased above the minimum necessary if the higher numbers are achievable.

All problems categorized and visible in INFO database.

Problem categorization is an age-old problem. This is a good idea.

Numerous indicators of program progress used.

These are necessary. This is not micro-managing, nor is it a matter of trusting the contractor. It is simply a matter of tracking. I want to see this in the program office and in the HQ staff office. This is important and necessary because the SPO and HQ deal with different problems as does the contractor.

TESTING AND TRAINING

Testing as early in development as possible.

As a general statement this is correct and necessary, but you

must be careful of what testing means. If early testing is to be conducted on modules, it should be stated as such.

Both structured and unstructured testing conducted. Without a doubt this is important. Unstructured tests could be conducted during operational testing. Currently the DOD conducts two major types of structured testing: 1) development testing to ensure that the product meets specifications, testing the product against the environment defined by the users requirements, 2) operational testing to ensure that the product meets user needs, testing the product in the user's actual environment.

User involved in planning and performing test scenarios. Yes, user involvement is definitely needed in planning and performing operational test scenarios.

Site personnel trained before system delivery. Yes, but this includes much more than having personnel trained. The site must also be prepared and ready to support the system before it is delivered.

After delivery, detailed site specific testing conducted. Yes, this is needed continuously and forever. Don't forget the importance of test feedback, tracking action items, and correcting action items. A big feedback loop is needed.

CONCLUSION

The views expressed herein represent Mr. Drelicharz's personal opinions and may not reflect any positions held or promulgated by DOD or DSMC.

NAME: Ms. Darleen Druyun

TITLE: Principal Assistant to the Deputy Chief of Staff
for Contracts
AFSC/PK
Andrews AFB, D.C. 20334

DATE: 27 June 88

TIME: 1200 hr

PLACE: HQ AFSC, Andrews

CONTRACT

It is important to match the contract type to the inherent program risk. If this is not done then the contractor is put in a 'mission impossible' situation. Program risk is composed of technical, schedule and cost risk, all of which must be balanced and offset against each other. A CPIF/AF type contract indicates that the contract was high risk.

Award Fee and Incentive Fee Used Jointly. The Award Fee is very important. Currently HQ AFSC is preparing an Award Fee Guide to increase the combined use of AF and IF in the Air Force. The AFSC goal is to 're-energize' the use of the Award Fee.

Use award fee to focus the contractor's attention on that which is important, critical to program success. Have the evaluation criteria change to meet what is critical to meet each milestone.

Award fees are necessary because they motivate the contractor in areas other than cost-the primary purpose of incentive fees. Some examples of areas award fees can be used to motivate/focus the contractor:

- 1) put the right talent on the project,
- 2) to get personnel up-to-speed faster,
- 3) improve the management information systems used,
- 4) improve contractor's management of subcontractors,
- 5) improve quality

"I am a firm believer in the power of Award Fees." They are applicable to every contract because they are built around the areas that the PM considers critical to his/her specific project. Award Fees are especially important in the more complex environment.

To be effective, the potential payoff from the Award Fee must be substantial. The percentage should be equal to that for the incentive fee.

Contractor's like Award Fees because the process provides them with feedback. They have a more concrete idea of where they stand. Feedback is also provided to the PM.

But, Award Fees are not used much because they are work. Work to develop, and a lot of work to administer.

Waterfall implementation plan.

Realistic schedule providing some slack. According to AFSC Acquisition Strategy Principles, one of the criteria against which the acquisition strategy is to be judged is the degree to which the schedule is realistic. It is stated that the program schedule must be realistic. The user need date must be balanced against the resources available.

Funds budgeted to support participative requirements. Important, a result of teamwork between SPO functions. According to AFSC Acquisition Strategy Principles, the proper allocation and timing of program funds are crucial to program execution. The problem is the unstabilizing effect congress has on the funds appropriated.

Detailed requirements generated by the user. Necessary, again part of teamwork. According to AFSC Acquisition Strategy Principles, before a program acquisition strategy can properly be defined, the PM and the user must have a clear understanding of what is required. The acquisition strategy must reflect that understanding. One of the criteria against which the acquisition strategy is to be judged is the degree to which the strategy meets the users needs.

Problem resolution impacts contractor payment schedule.

TEAMWORK

AFSC is emphasizing teamwork internally within the SPO. It is the PM that ensures that all constituents work as a team. The SPO organization can either be a separate team or matrixed in.

Integrating all functions is vital. The PM must check and crosscheck how the requirements and responsibilities of all functions interrelate to be sure that one area is not "killing" another.

All constituents involved in planning and scheduling. Definitely.

Lateral communication channels open. The PM sets the stage. Communication up, down and laterally is very important. Caution, the PM must be kept informed and in the picture, the right hand must know what the left hand is doing.

Teamwork is vital to providing a systematic process to apply AFSC resources to the users's need/problem. All of

the functional disciplines involved must function as an integrated unit. From AFSC Acquisition Strategy Principles.

Frequent meetings used to resolve differences.

Responsibilities accepted, not assigned. Yes, to some degree.

One face to users and management.

All functions involved in problem resolution. Yes.

PARTICIPATIVE LEADERSHIP

All elements listed below are absolutely necessary. 'The user must be intimately involved'. If all of the requirements established by the user can't be met, then it is up to the user to make the appropriate tradeoffs. It is important to talk with the user, lay out options as well as problems.

Site representatives involved from start to finish.
User involved and sometimes assigned full-time to the SPO in most Air Force programs. Often users even go visit the contractor with the SPO team.

User input requested in all areas and all phases.
Extremely important. By involving the user, they understand the tradeoffs that have been made, and the acceptance rate is higher. Must have the users and the SPO working side-by-side.

With the ATF TAC users are assigned full-time to SPO. The decisions concerning requirements tradeoffs and alternatives are left up to the user to make.

Site input actually used. Yes

Users kept informed, frequent site briefings and memos.
Yes, this is necessary.

Problems solved at the lowest level possible. Yes

Users allowed to voice disagreements and concerns. Yes

FOCUS

This is common sense, but it is where you run into most of the problems. A golden rule is, 'Don't change the baseline.' But if participative leadership is in place the user won't want to change the baseline because they will understand the alternatives, and will have made all of the necessary tradeoffs.

No bells, whistles, or additive fixes were added.

Innovation restricted to the original program scope.

Studies performed by support contractors limited.

CONTRACTOR AND SYSTEM MONITORING

Excellent MIS on contractor's part can negate many of these requirements. The degree of system monitoring necessary depends on the contractor's reputation, their MIS, and the degree of risk/type of contract. In some cases "micromanagement" may be necessary. Sometimes a program has to be managed by "inchstones."

In all situations, the PM must gather as much feedback and data as possible. The PM must be alert and "not sleep" through monthly meetings.

Actual demonstration of requirement before sign-off.

Technical Performance Measures established up front.

RMA established up front, and achievable.

All problems categorized and visible in INFO database.

Numerous indicators of program progress used.

TESTING AND TRAINING

According to AFSC Acquisition Strategy Principles, a disciplined test process must be defined up front. The result will be executable test objectives, measurable test criteria and increased chance of program success.

Testing as early in development as possible. This is so true. Start modular testing ASAP. If one module collapses the redesign of all modules is required, the more lead-time on the problem the better. Up front testing can prevent the need for major redesign.

Both structured and unstructured testing conducted. Ms. Druyun doesn't believe that the Air Force uses much unstructured testing. It could be applicable.

User involved in planning and performing test scenarios. Yes, this is necessary.

Site personnel trained before system delivery. This should be a PM goal. The PM should make every attempt to get support equipment and simulators out there ahead of time.

Assured System Availability is a new AFSC innovation to get support equipment and documentation into the field ASAP. It involves writing the right incentives into the contract to motivate the contractor. A new concept.

After delivery, detailed site specific testing conducted: A standard requirement.

CONCLUSION

All of the items listed above apply to all DOD acquisition programs. They are all common sense. The difficulty lies in getting them implemented. A new AFSC concept should help do this.

The Acquisition Strategy Panels have a proactive versus a reactive focus. The panel was established to ensure that PMs have good upfront planning. The PM plan should address the implementation of each element in these 'menus for success.'

The panel is composed of experts representing each functional area. The user is included as part of the panel. The ASP will make sure that the PM is on the right track, and provide lead time ahead of problems. AFSC Regulation 800.53 is the document establishing the ASP.

According to AFSC Regulation 800-53: 'The overall objective of an ASP is to ensure that a systematic and disciplined approach has been developed to meet the users' needs within resource constraints and that the approach is consistent with the program management directive.'

The ASP is to be conducted before the acquisition plan is submitted for approval. The program director brings in the acquisition strategy that they have formulated, and briefs that strategy to the ASP.

Air Force Systems Command has recently outlined 'Acquisition Strategy Principles.' The acquisition strategy is defined at the plan for program execution, the PM's blueprint to achieve the user's requirements. The document outlines three key principles to be used as a framework for designing an appropriate acquisition strategy: 1) Resources, 2) Processes, and 3) Criteria.

Resources are the raw materials available to AFSC such as people, technology, dollars, and facilities.

Process are provided by all involved functional disciplines to apply the available resources to the problem. The processes must function as an integrated unit and include:

- 1) Requirements
- 2) Engineering
- 3) Support
- 4) Test
- 5) Budget
- 6) Business

Criteria are used to assess the acquisition strategy developed so far, and ensure all areas are addressed. The following questions must be asked of every acquisition strategy to ensure its excellence:

- 1) Does it meet user's need?
- 2) Has the appropriate technology been applied?
- 3) Is the plan integrated?
- 4) Have alternatives been considered throughout the process?
- 5) Are the risks understood?
- 6) Is the schedule realistic?
- 7) Are the costs understood?
- 8) Is the process streamlined?
- 9) Is the plan executable?
- 10) Does it represent best value?

NAME: Colonel Harry Gillogly III

TITLE: Deputy Chief of Staff, Technology
and Requirements Planning
AFSC/XT
Andrews AFB, D.C. 20334

DATE: 27 June 88

TIME: 1000

PLACE: HQ AFSC, Andrews

CONTRACT

Award Fee and Incentive Fee used jointly (CPIF/AF).
Standard.

Waterfall implementation plan. Useful, have used.

Realistic schedule providing some slack. Need.

Funds budgeted to support participative requirements.
Need.

Detailed requirements generated by the user. A potential problem. When you involve a variety of groups in establishing requirements, each group will bring in different functional expectations. Each individual also brings biases for what system should do.

"How did they stabilize their requirements?" User stability is an important ingredient. There is a big difference between FAA mission and DOD mission. The FAA mission is much more stable.

Problem resolution impacts contractor payment schedule.
A good way to incentivise the contractor. Negative reinforcement, holding contractor's money has a big impact.

TEAMWORK

Each PM has their own management philosophy. Most PMs in military rarely have black and white decisions, so they must rely on support from their people and from the contractor.

The PM team must discover alternatives and be available to discuss alternatives. The PM then makes decisions based on these inputs.

Teamwork is important but as a word of caution, some displacement is needed between the program manager (including the program management team) and the contractor. This is necessary to ensure that the PM won't make decisions conciliatory to contractor's whims.

Teamwork is good, but the PM still has to keep the contractor's feet to the fire.

All constituents involved in planning and scheduling.

Lateral communication channels open.

Frequent meetings used to resolve differences.

Responsibilities accepted, not assigned.

One face to users and management.

All functions involved in problem resolution.
Fundamental. It is especially important to involve logistics representatives.

PARTICIPATIVE LEADERSHIP

All of these items are absolutely essential.

Site representatives involved from start to finish.
Based on WIS experience, this is very important. The user must help develop requirements and schedules.

User input requested in all areas and all phases. Yes

Site input actually used. Yes

Users kept informed, frequent site briefings and memos.
Most definitely. If users are not kept informed, the program manager will have problems.

Problems solved at the lowest level possible. 'I've always believed in this.'

Users allowed to voice disagreements and concerns. Yes

FOCUS

Very important area. The program manager, contractor and user must all come to an agreement as to what is going to be done in the program. You can't let the baseline be destroyed. All ideas must be evaluated against the baseline. Innovations should only be dismissed if they violate your baseline. A baseline is violated if the schedule is extended, or if funds aren't available.

No bells, whistles, or additional fixes were added.

Innovation restricted to the original program scope.

Studies performed by support contractors limited.

CONTRACTOR AND SYSTEM MONITORING

Actual demonstration of requirement before sign-off.

In a C-cubed procurement demonstration is possible. In other procurements it isn't. Prototyping is nice because it reduces risk. Sometimes "fly before you buy" does not work.

Very important. Definitely worth your time. It is not necessarily micromanagement to hold individuals/the contractor responsible. In WIS every requirement was validated. The AF currently has a mechanism to do this, it is called the "Critical Design Review."

Technical Performance Measures established up front.

Very important. The best way to establish TPMs, is to get the contractor to propose what they are going to do to monitor themselves. This is especially true during production/development.

RMA established up front, and achievable. RMA must definitely be achievable and quantitative. It is up to the program office to analyze if user specified RMA standards are "real life" achievable. The PM must look at what is "achievable" versus what the user believes "should be."

The PM should only promise what good analytical checks of the state-of-the-art-technology as applied to the environment of intended use indicate are achievable. This is especially crucial when procuring aircraft, because the environment is unknown and many judgement calls must be made.

All problems categorized and visible in INFO database.

This is necessary. The Air Force currently uses a system similar to INFO called "FRACAS." It is important to record problems in BOTH factory and operational testing. Often problems are not recorded in factory testing, then those same problems are discovered later in operational testing. Earlier recording would have provided extra lead time.

Numerous indicators of program progress used. Depends on the system being procured, and the type of contract. In software intensive programs close monitoring is vital because no one really has a good handle for how long it takes to write so many lines of code. For software procurement, the use of "software metrics" is recommended.

TESTING AND TRAINING

Testing as early in development as possible. Yes

Both structured and unstructured testing conducted.

There are possible problems with this. You must be careful that the unstructured testing doesn't generate new requirements that will disrupt the baseline. Unstructured

testing is fine if the purpose is to validate a specific set of problems.

With WIS, they were concerned about achieving a user friendly system, so unstructured testing could have been used to address the problem. Potential "ungraceful exits" could have been identified.

A final caution, if unstructured testing is used, be sure that requirements are well structured, and that the baseline is firmly established.

User involved in planning and performing test scenarios. Couldn't agree more.

Site personnel trained before system delivery. Training is almost always planned for, yet it is not actually done too often. Training before delivery is hard to achieve. The user must keep the old system going and often can't afford to send users off for training. One possible fix is to send trainers into the field.

After delivery, detailed site specific testing conducted. Yes, this is necessary.

CONCLUSION

Looking at these "Menus For Success", all of these are important. The principles of management for program management are pretty well known throughout DOD, they are taught at DSMC, and they are outlined in regulations. The problem is implementation.

If implementation is the problem, then the key is writing a program plan ahead of time telling how and when you plan to meet all of the items on this "Menu of Success." It is also important that the plan address all of the elements, not just a few.

NAME: Lt Col Paul Huegel

TITLE: Chief, Programs, Analysis and Initiatives Division
Directorate of Policy & Programs
AFSC/SDX
Andrews AFB, D.C. 20334

DATE: 28 June 1988

TIME: 1000

PLACE: HQ AFSC, Andrews

CONTRACT

All of these elements are fundamental. It is most important to correctly define user requirements. It is next most important to set up the contract to facilitate program success. The Acquisition Strategy Panel and AFSC Acquisition Strategy Principles help to accomplish this.

AFSC is very proud of their efforts in this area. The Acquisition Strategy Panel facilitates up front planning for contract type and program management. The panel is composed of a "set" group of experts, all hand picked, that go out on reviews.

Award Fee and Incentive Fee used jointly (CPIF/AF).
Current regulations clearly state that the focus on contracts should be consistent with all program characteristics, including risk. (Cost Plus versus Firm Fixed Price type of contracts) The combination of IF and AF is an interesting concept. The Air Force hasn't done much with Award Fees to motivate the contractor. Darleen Druyun is the contracting expert for AFSC, and can shed some light into this area.

Waterfall implementation plan.

Realistic schedule providing some slack.

Funds budgeted to support participative requirements.
The idea here is good. This is definitely an area that requires attention. The main problem is that application would require changing some regulations. Air Force budget policy states, the person making the trip will fund the TDY. This means that the user must fund their own trips to provide program support.

In the past the PM had enough flexibility within his/her RDT&E 3600 money to enable the program to fund many participative user TDYs. The days of sufficient travel money are gone. Prior obligation of RDT&E funds to other areas, and the lack of slack in the program O&M funds have virtually eliminated the PMs ability and willingness to fund user TDYs.

Users are supposed to fund their TDYs out of their own O&M money. This is a problem because there is rarely any slack in organization O&M funds, and funding TDYs is low priority.

The first of General Randolph's three prime goals for Systems Command is to 'Meet the user's needs.' This is a serious problem, General Randolph wants AFSC people to meet with the user, to keep close to the user, and to know the user's needs but the TDY funds are not there to do it. Everything done at HQ AFSC is focused on the goal of meeting the user's needs.

Detailed requirements generated by the user. Agree. This is definitely necessary. In 1987 the requirements process was revised, and the Requirements Regulation 57-1 is the result. The bottom line is that the requirements process is now in the hands of the user. In the past the requirements process was driven by HQ AFSC.

Under the new process, the user provides a general/macro statement of operational need (SON). HQ AFSC takes the user's requirements, in the form of the SON, and provides the options and alternatives to the user that fulfill the requirement. The cost of each option and alternative is provided.

The purpose of this process is to control requirements creep. By preventing the PM from 'feeding the user requirements', the contractor is no longer able to use the PM to tell the user about 'nice to have' technology. This greatly reduces the number of user requirements that are not necessary to meet the user's SON.

General Randolph established the Technology and Plans DCS to better manage the technology transition and ensure that the requirements process works according to the new regulation.

The other primary issue, the USAF does not want detailed requirements from the user. Requirements are wanted in terms of need instead of end product. This will prevent the USAF from being 'locked in' to any one alternative. Two of the ten criteria/questions outlined in AFSC Acquisition Strategy Principles to evaluate acquisition strategies can be met only if the user's requirements are from a macro perspective and in terms of need. These two questions are: 1) Does the strategy represent the best value?, and 2) Have alternatives been considered throughout the process?

Problem resolution impacts contractor payment schedule.

TEAMWORK:

To succeed the PM must preach and practice teamwork. The PM's team must go beyond SPO walls. The team must

include the AFPRO, HQ AFSC, the Pentagon, and the contractor.

Very important. General Randolph has established three primary goals for Systems Command: 1) meeting users needs, 2) maintaining excellence in acquisition, and 3) enhancing technological superiority. General Randolph proposes to implement these goals through better teamwork and improved cooperation between: 1) users, 2) HQ AFSC, 3) SPO, and 4) the Pentagon (SAE and DAE).

One of the current problems is a lack of effective teamwork and communication at the staff level. The proposed solution is to focus on teamwork.

Another area of concern is keeping AFSC HQ involved in the program management process. This is seen as important to ensure that the necessary resources are available to support Air Force programs, and that baselines are executable. General Randolph wants to dissolve the separation between HQ and the rest of the command. He emphasizes that everyone must think of AFSC as one integrated unit and work as a team. One of the primary vehicles for accomplishing this is to improve communication.

'A good PM takes advantage of teamwork.' Holding the PM accountable provides the incentive for the PM to use the elements of teamwork in program management.

A second teamwork problem arises between the SPO and AFPRO. Physically separated, these two areas often do not coordinate or communicate. If the PM is on the ball, and really using all of the communication channels open to him/her then he/she will use the AFPRO because of the wealth of information the AFPRO has access to.

The idea of contractor/government team effort has always been promoted at AFSC. On the other hand, the Air Force has never really trusted the contractor. This lack of trust is a significant problem area. It is hypothesized that there is a high correlation between trust and productivity, therefore teamwork initiatives (between gov't and contractors) are being pursued.

Looking at the realities of the situation, every time acquisition policy-makers are making headway with congress to implement these teamwork initiatives another skeleton falls out of the closet and Congress adds more 'legislative impediments.' The addition of 'preemptive oversight' type legislation prevents the PM from focusing on the management principles composing these 'Menus for Success'. Still, acquisition policy makers are trying to change the law to facilitate teamwork between the government and contractors.

All constituents involved in planning and scheduling.

Yes

Lateral communication channels open. Much effort is going into improving this area in AFSC.

Frequent meetings used to resolve differences. Yes.
The idea of team effort between the contractor and the government has always been promoted at AFSC. That is why the Air Force has program reviews. On the other hand, the Air Force never completely trusts the contractor.

Responsibilities accepted, not assigned.

One face to users and management.

All functions involved in problem resolution. This is the basic premise of acquisition streamlining. By placing responsibility and accountability in the hands of the PM, the PM has the incentive to establish an environment that facilitates this. If the PM does not work with the contractor to resolve problems then the chances of poor program execution increase accordingly.

PARTICIPATIVE LEADERSHIP

Site representatives involved from start to finish. A good idea. Site activation teams work with the users.

User input requested in all areas and all phases.
Good, agree.

Site input actually used. Yes

Users kept informed, frequent site briefings and memos.
Yes, this is necessary.

Problems solved at the lowest level possible. Yes.

Users allowed to voice disagreements and concerns.

FOCUS

No bells, whistles, or additional fixes were added.
Program stability is very important. HQ AFSC has done a lot of work, and is planning to do a lot more. They are pushing to get a single integrated program baseline that everyone signs up to. The baseline is the document that stabilizes requirements. It takes the resources available through the PPBS, and ties them to a program so that the executive system of 'oversight' can manage the program.

The acquisition program baseline is a formal agreement among the PD, PEO, SAE. No baseline changes are allowed unless they are approved by the SAE. The primary purpose is to establish commitment and accountability.

Because of the outside influences it can be hard for a PM to manage the baseline. Changes caused by congressional funding are an example of such outside influences but, this doesn't negate the importance of the baseline.

Innovation restricted to the original program scope.
Yes, important.

Studies performed by support contractors limited.
Agree. The use of support contractors in the Air Force is increasing because manning is decreasing. There is nothing wrong with consultants, someone must fill the void, but the PM must use them parsimoniously.

CONTRACTOR AND SYSTEM MONITORING

The major focus of acquisition policy makers in this area is to streamline the process. There are several HQ AFSC initiatives to do this. Essentially, the gov't is trying to get out of the business of detailed and intensive contractor monitoring.

The Model Contractor Program is a new initiative to substitute contract remedies and good warranties for government surveillance. The idea is to allow industry to get back to their principal role of producing quality hardware by removing some of the oversight requirements. The expected results are a high quality product and an iron-clad warranty.

The Enterprise Programs are another effort to streamline the acquisition process through "regulatory relief." Regulatory relief involves waiving whichever regulations the PM can. Certain programs are selected each year based on the stability of the program. Congress then gives the program multi-year authorization, not to be confused with multi-year appropriation. Every year the list of programs being managed as Enterprise Programs is expected to increase.

For the enterprise programs streamlining focused on:

- | | | |
|------------|------------------------|--------------|
| 1. Reports | 2. Reviews/Briefings | 3. Budgeting |
| 4. Testing | 5. Contracting | 6. Logistics |
| 7. Data | 8. System Architecture | |

The purpose of the Flexible Oversight Initiative is to match the level of oversight of contractor operations to the level of program risk, and the level of confidence in contractor performance. Oversight should be increased if contractor performance deteriorates. The expected results from this are better matching of oversight requirements and resources, better risk management, and reduced contractor oversight where appropriate.

The primary questions behind the Contractor Database Initiative are: 1. When is oversight enough?, and 2. How much should you trust the contractor? In Systems Command they are reviewing the track record and past performance of contractors, and building a database with the information. The purpose of the database is to assist in source selection

decisions by providing the information to determine who the better performers are.

The Could Cost / Total Quality Management (TQM) Initiative involves the joint implementation of these two concepts. The goal is to improve the quality and lower the cost of Air Force system acquisitions. These concepts are very pervasive, not limited to acquisition.

The Could Cost concept includes the realm of 'should cost'. The focus is on maximizing efficiency to minimize cost. The basic goal is to identify the non-value requirements levied on the contractor which could be realistically reduced/eliminated.

Quality will be increased through acquisition incentives that encourage contractor performance and quality improvements. Included is the Air Force elimination of fixed quality levels in specifications.

Could Cost and TQM are very new ideas. Neither has been implemented, both are still in the concept phase. It is not known how enthusiastic the people in the field are going to be about the concept. Teamwork with industry is essential to achieve the goals of this initiative. Currently, the C-17 and the B-2 SPOs are actively applying Could Cost/TQM to improve quality and cost performance.

Actual demonstration of requirement before sign-off.
Necessary.

Technical Performance Measures established up front.
Yes, the new requirements process, TEMP, outlines this as necessary.

RMA established up front, and achievable. Yes, the new requirements process, TEMP, outlines this as necessary.

All problems categorized and visible in INFO database.
Maybe, really not too familiar with this area.

Numerous indicators of program progress used. Maybe.

TESTING AND TRAINING

Testing as early in development as possible. Good point. HQ AFSC is currently putting a lot of emphasis on getting an early start on testing. It is important, and should be done. A new requirements process called TEMP has been instituted to get planning for testing up front. TEMP is a requirements correlation matrix that shows testing requirements, specifications, thresholds, and goals. It helps to 'nail down' the testing process.

A lot of factors play against early testing, some of the major factors are outlined below:

1. For the PM, the more test requirements levied on him, the more chances that the program will be slowed down.
2. Test requirement funding, the more testing that is done, the greater the cost.
3. What if problems are found. Often the team is afraid of finding problems. They are afraid that they may not like the answer, it may jeopardize the program. This is the political aspect.

Both structured and unstructured testing conducted.
"The Air Force currently sticks to structured testing as far as I know." It is more important to have a good structure than performing unstructured testing. A good structure allows planning for testing, and early testing. The real problem is that the Air Force does not structure tests well.

User involved in planning and performing test scenarios. Yes, this is important.

Site personnel trained before system delivery.
Important. Most PMs talk about it, but it is not done too much. One of the primary limiting factors is funding constraints.

After delivery, detailed site specific testing conducted. Yes, this is necessary. Operational test and evaluation is currently performed in Air Force programs.

CONCLUSION

Everything here has been thought of long before. What has the potential to be different is the method of implementation and the people. There are things that the Air Force has done along these lines, and those things are good, but there is still a long way to go.

Some, but not all, of the current HQ AFSC initiatives are:

1. Acquisition Reporting
2. Baseline Consolidation
3. Could Cost and Total Quality Management (TQM)
4. Acquisition Regulation Streamlining
5. Flexible Oversight
6. Model Contractor Program
7. Acquisition Information Structure

NAME: Mr. Ira Kemp

TITLE: Associate Director
Directorate of Contracting and Manufacturing Policy
SAF/AQC
The Pentagon
Washington, D.C. 20330

DATE: 29 June 1988

TIME: 1000

PLACE: The Pentagon

CONTRACT

Award Fee and Incentive Fee used jointly (CPIF/AF).
Nothing new, used frequently. This is used as an opportunity to get up close and personal with the contractor. Provides some incentive, but not a great deal.

Waterfall implementation plan. Of course this is necessary. It is always effective to "build on the learning curve" and have the core team move from site to site.

Realistic schedule providing some slack. This is smart, there is certainly nothing wrong with this. I am an advocate of realistic schedules. The problem is that too many programs have unrealistic IOC dates without full regard for budget/cost and technical considerations.

Funds budgeted to support participative requirements.
Important. Either the user or the PM should be considering these requirements in their budget estimates.

Detailed requirements generated by the user.
Conceptually the user generates the SON, and the procuring agency then provides the user with the alternatives that meet the SON. A decision would then be made based on the best alternative solution. In reality it will be predetermined how to best accomplish the job. Also, if the number of alternatives to meet a user's need are fairly limited, then the SON pretty much defines the requirements. But again, according to current procedures, the user only generates the SON, not the specific requirement.

Problem resolution impacts contractor payment schedule.
This is a good incentive. A good management technique, and a good attempt to organize and manage problems.

TEAMWORK

All constituents involved in planning and scheduling.
A nice idea, but be sure that someone is in charge.

Lateral communication channels open. All channels must be open for the program to function properly. People must feel free to use informal channels, but management must be kept informed.

Frequent meetings used to resolve differences. Yes, but with a defined agenda known by the parties involved.

Responsibilities accepted, not assigned. People must know what they're responsible for, some will do less and some will do more. Assigned versus accepted depends on the quality of the individual, practicality in staffing, and trust in people.

One face to users and management. This generally works. There is always the potential that the contractor is impacted by someone influential who gets the contractor off of the track. It is up to the PM to keep the contractor in line, and to get the contractor to understand the specific sources that guidance and changes can come from.

All functions involved in problem resolution. Maybe this is OK, maybe it is not. The PM gets paid for weighing alternatives. Kicking the contractor is not always the thing to do. Every so often the PM must go the extra mile and help the contractor to get over the hump.

PARTICIPATIVE LEADERSHIP

Site representatives involved from start to finish. Yes. The award fee facilitates this. It gives the user the ability to provide input for the evaluation of the contractor.

User input requested in all areas and all phases. Yes. User input is very important. It is a good source of information for the PM.

Site input actually used. Yes.

Users kept informed, frequent site briefings and memos. Yes, definitely.

Problems solved at the lowest level possible. Yes. I certainly agree. If this was not done, then the higher levels of management would not survive.

Users allowed to voice disagreements and concerns. Certainly.

FOCUS

No bells, whistles, or additional fixes were added. I can accept this. This used to be a much bigger problem, baselining holds this under control now. It is important to evaluate each item: Do you need it because you would like to have it? or Do you need it to make the program work?

Innovation restricted to the original problem scope.

Studies performed by support contractors limited.

CONTRACTOR AND SYSTEM MONITORING

It depends. "Micromanagement" is sometimes good, and sometimes bad. The convolutions and conflicts are incredible. There are no truisms in this area.

The current initiatives to streamline may or may not impact this area. The idea is to reduce the degree of contractor monitoring, but in many cases the number of steps are reduced but the amount of detail within each step is increased.

Actual demonstration of requirement before sign-off.

Technical Performance Measures established up front.

RMA established up front, and achievable.

All problems categorized and visible in INFO database.

Numerous indicators of program progress used.

TESTING AND TRAINING

Testing as early in development as possible. Yes. You have got to know whether the criteria are met ASAP. That way, if changes are needed they can be cranked in. It is important to remain flexible! Testing will cause you to make changes and tradeoffs within the technical and budget baseline.

Both structured and unstructured testing conducted. Yes. The Air Force tries to approach unstructured testing in a more logical method. You can "crash" a computer, but you can't crash an airplane. With aircraft the envelope must be expanded gradually. The computer is a safer environment.

User involved in planning and performing test scenarios. Absolutely.

Site personnel trained before system delivery. This is necessary, and always intended. Without this the system is useless. The most crucial part of any system! For example, an F-15 is relatively easy to deliver, but finding pilots to fly it and maintenance people to repair it is very hard if they have not been trained.

After delivery, detailed site specific testing conducted. Yes.

CONCLUSION

What works for one PM may not work for another. It depends on the PM and the organization. Still, there has to be structure and guidance. There must be parameters defined for decisions. As long as they have that, an organization can move forward. But, policy-makers must be careful not to overload the organization, or it will stop dead.

Program managers can not merely rely on common sense to manage a program because too many people believe in rules and legislation. If you do what makes sense, it invariably won't make sense to auditors, the IG, the GAO etc. Before you know it, all of these organizations will be screaming "fraud."

NAME: Colonel (Retired) James Lindenfelter

TITLE: Manager of the Defense Acquisition
Management Department
Systems Management Group
The Analytic Sciences Corporation
1700 North Moore
Suite 1800
Arlington, VA 22209

DATE: 8 July 88

TIME: 0900

PLACE: The Analytic Sciences Corporation (TASC)

CONTRACT

Award Fee and Incentive Fee used jointly (CPIF/AF).
Agree, both are good.

Waterfall implementation plan.

Realistic schedule providing some slack.

Funds budgeted to support participative requirements.
This is not really applicable. It is not important whether the user's funds or the SPO's funds are used.

Detailed requirements generated by the user. No, not detailed. The user should generate the need, not detailed requirements. Need statements should not contain detailed system descriptions. This allows competition between concepts, and promotes nontraditional and innovative solutions. Too often DOD need statements do contain weapon system solutions, which is not optimal.

The user and the program management team should work together to collectively make the tradeoffs between alternatives to determine how to best satisfy the need. Further, the user must be involved in determining if the specifications selected meet their need.

Problem resolution impacts contractor payment schedule.
A successful program has to have a cooperative contractor. Cooperation can be achieved through this and similar contract elements.

TEAMWORK

Teamwork is important, needed, and the only way to do business. All successful programs have teamwork. However, teamwork does not guarantee a successful program. Some unsuccessful programs have good teamwork too.

In the DOD the definition of teamwork is very broad. It includes the efforts of the SPO, training command, Air Staff, the Secretariat, the Office of the Secretary of Defense, Congress, the PM and the user. Teamwork can be used in DOD to ensure program environment stability. A disruptive environment kills both the program and the PM.

In addition to teamwork, a cooperative contractor, a stable environment, etc, it is also important for the PM to understand the contractor, and the contractor's systems and engineering functions.

The concept of teamwork within the SPO should also be addressed. The PM must trust his/her people, and hold them accountable for the responsibilities assigned.

The teamwork between the government and the contractor is directly affected by external factors. Every time DOD gets bad publicity, the relationship between the service and the contractor gets strained. Environment is very important. Luck and timing are key players in this area. Poor publicity in one area of DOD adversely impacts other areas.

All constituents involved in planning and scheduling.

Lateral communication channels open.

Frequent meetings used to resolve differences.

Responsibilities accepted, not assigned.

One face to users and management.

All functions involved in problem resolution.

PARTICIPATIVE LEADERSHIP

A PM has got to have the user on his/her team.

Site representatives involved from start to finish.
Very good and very important. One of the reasons that the Air Force has moved towards the baseline concept is to increase user involvement. The intent is to match programs content, dollars and schedule to promote understanding and stability.

User input requested in all areas and all phases.

Site input actually used.

Users kept informed, frequent site briefings and memos.

Problems solved at the lowest level possible.

Users allowed to voice disagreements and concerns.

FOCUS

All of these elements are important.

No bells, whistles, or additional fixes were added.

Innovation restricted to the original problem scope.

Studies performed by support contractors limited.

CONTRACTOR AND SYSTEM MONITORING

The degree of program oversight should be the minimum necessary to ensure that the program objectives are met. Program objectives include schedule, budget and field performance. The PM must work in unison with the contractor to determine the degree of oversight necessary.

Actual demonstration of requirement before sign-off.

Technical Performance Measures established up front.

RMA established up front, and achievable.

All problems categorized and visible in INFO database.
A good management technique. All good PMs should have a system to do this.

Numerous indicators of program progress used.

TESTING AND TRAINING

Philosophically these elements are in league with DOD objectives. In actuality, DOD is having a hard time meeting these elements. Testing especially has been under scrutiny. DOD has a testing agency with an independent tester in each service.

Testing as early in development as possible.
Definitely important. Testing is an integral part of process and system monitoring. This element applies to both development and operational testing. DOD is trying to head in this direction. Operational testing conducted early in development is difficult, but it can be done thru simulations and modeling.

Both structured and unstructured testing conducted. I like this element.

User involved in planning and performing test scenarios. Absolutely imperative.

Site personnel trained before system delivery. This is very important. This element can not be an afterthought. Training must be an integral part of the program.

After delivery, detailed site specific testing conducted.

CONCLUSION

All of these things are good things, but both funding stability and requirements stability must be there first. For a program to be successful the PM has got to have the user on the team, and there has to be baseline, budget, and environment stability. If any one of these four elements is missing, the program is likely to fail.

The primary problem with this list of program management elements identified by the Host program management team is that they can all be found in unsuccessful programs too. These elements don't guarantee success. A successful program has all of these menu items plus a few additional items, especially stability. It is also important to remember that in DOD some things that are good management precepts don't work as well as expected because of DOD's environment.

A good program manager doesn't necessarily make a program successful, neither does good management. Having a few unsuccessful programs isn't bad, and doesn't always indicate poor management. Programs that are not achieving their primary objectives should be cancelled, and the PM should be rewarded if he/she had managed the program well. Of course this is not what happens in DOD.

These areas should be considered for inclusion in the program management 'Menus for Success' developed by this research:

1. Emphasize stability more.
2. Quality personnel are a key element to program success. 'Black' programs work better because they get better people. Address the people issue more in the elements from Host.
3. The PM must understand the POM, resource allocation, process. Without this understanding the PM is lost. It is within this process that the PM can work to maintain stability. Resource allocation is the 'name of the game.' The PM has little control over output, but input can be provided.
4. The need to track system performance and program schedule must be added to the Contractor and System Monitoring elements.

5. In addition to the other Teamwork elements, the PM must understand the contractor, their monitoring system, and what is being done in engineering. Any successful program requires this. FAA most likely did this up front too.

6. A cooperative contractor is vital. Contract elements can be used to motivate a contractor to cooperate.

7. Luck, in terms of judgement and external factors, plays a major role in program success. Competency and luck go hand in hand. There is a mystical quality of this entire thing. I would rather be lucky than good. PMs can contribute to their own good luck. The right team, right PM and right congressman speaking up at the right time all contribute to luck. The right program manager is also an issue because most DOD PMs are relatively untested as PMs before they get their first program.

The uncontrollable items are an important factor in the success of the program. For example, you are a PM, doing a good job managing your program, when some fraudulent practices are discovered in a program completely unrelated to yours. All of a sudden your program or primary contractor is affected because one of their other branches is under investigation.

The very nature of judgement implies more than one alternative and multiple outcomes. Picking the alternative with the best outcome requires as much knowledge as possible supported by an intuitive sense. This is an integral part of being a good PM. The PM must know how to work the system! For example, hitting for more funds at the right time, or having a problem and knowing when to strike.

NAME: Mr. Daniel S. Rak

TITLE: Deputy Assistant Secretary of the Air Force
(Acquisition Management and Policy)
SAF/AQ
The Pentagon
Washington, D.C. 20330

DATE: 1 July 88

TIME: 1500

PLACE: The Pentagon

CONTRACT

Award Fee and Incentive Fee used jointly (CPIF/AF).
Should be based on the degree of risk involved. The share ratio between IF and AF can be varied. This combination gives the maximum latitude in management and flexibility.

The Contracting Officer and Program Manager should be innovative, but they should not abandon the basic contract structure and elements.

Waterfall implementation plan. Yes, this is necessary and it is currently used by DOD.

Realistic schedule providing some slack. Yes, this is necessary. Unfortunately the Program Manager is often pushed into an unrealistic schedule.

The baselining process is a new innovation which may be able to force a more realistic schedule from the user. The chain of command has been shortened for the baseline approval. The PM is now held accountable for meeting the baseline. Before the PM signs the baseline, the user has to sign off on the baseline.

Under the old baselining system, baselines were cumbersome and hard to get into place. Under the new baselining process there is a clear and direct line between the PM and the Service Acquisition Executive (SAE). This process will force the PM and the user to jointly establish a firm and realistic schedule.

Funds budgeted to support participative requirements.
This might be nice. Currently it is up to the user to budget for and fund their own TDYs in support of the program.

Detailed requirements generated by the user.

Problem resolution impacts contractor payment schedule.
Not really a parallel from DOT to DOD.

TEAMWORK

Teamwork is necessary. To the extent that DOD can, it does use teamwork. Teamwork is also emphasized within the SPO. The degree of teamwork necessary and appropriate is dependent on the type of contract.

All constituents involved in planning and scheduling.

Lateral communication channels open.

Frequent meetings used to resolve differences.

Responsibilities accepted, not assigned.

One face to users and management.

All functions involved in problem resolution. There are times when this would not be appropriate. It depends on how much responsibility the government wants to take for the solution. Therefore, the PM must proceed cautiously. It also goes back to what the contractor is being paid to do.

PARTICIPATIVE LEADERSHIP

Agree, this is necessary. DOD is currently encouraging even more user participation.

Site representatives involved from start to finish. On major programs, a user representative is co-located with the SPO.

User input requested in all areas and all phases.

Site input actually used.

Users kept informed, frequent site briefings and memos.

Problems solved at the lowest level possible.

Users allowed to voice disagreements and concerns.

FOCUS

One of the reasons that the new baseline process requires that the baseline be firmed at a higher level than before is to inhibit the user from changing his/her requirements.

The new requirements development procedures will also help to stabilize requirements.

No bells, whistles, or additional fixes were added.
Absolutely, no question.

Innovation restricted to the original problem scope.
Absolutely, no question.

Studies performed by support contractors limited. This definitely makes sense.

CONTRACTOR AND SYSTEM MONITORING

The degree required depends on the program, but it is essential to every program irregardless of degree.

Actual demonstration of requirement before sign-off.

Technical Performance Measures established up front.

RMA established up front, and achievable.

All problems categorized and visible in INFO database.
Good idea.

Numerous indicators of program progress used.

TESTING AND TRAINING

Testing as early in development as possible. Good, needed.

Both structured and unstructured testing conducted.
Good, needed.

User involved in planning and performing test scenarios. Good, needed.

Site personnel trained before system delivery. Good, needed.

After delivery, detailed site specific testing conducted. Good, needed.

CONCLUSION

This program had such incredible flexibility, no wonder it was successful.

DOD currently does something in every category here. What is done depends on which acquisition phase the program is in. The most important key to a successful program is a realistic schedule. If you have this, you can make about any program successful. Next in importance is cost flexibility.

NAME: Colonel Ralph Tourino
TITLE: Inspector General
AFSC/IG
Andrews AFB, D.C. 20334
DATE: 30 June 1988
TIME: 1000
PLACE: HQ AFSC, Andrews

CONTRACT

If the Air Force had all of these contract elements that Host had, then Air Force acquisitions would be more successful. The reason that they wouldn't have some of these elements is external, out of the PM and CO's control.

Award Fee and Incentive Fee used jointly (CPIF/AF).
Agree. All contracts should have Award Fees. They are a key management tool to influence a contractor's manning, staffing and problem resolution. A big proponent of Award Fee type contracts. Incentive Fees not seen as quite so beneficial since the people who take action to meet the incentive won't be there to reap the benefits, but with Award Fees the person who takes the action will be there to reap the benefits.

Award Fees require discipline from both the SPO and the contractor. It is a neat tool, it can give the Program Director latitude since it is qualitative. Qualitative is the Award Fee's strength. As a caution, proper use of Award Fees requires trust on both sides. The contractor must view it as fundamentally fair.

Waterfall implementation plan. OK

Realistic schedule providing some slack. This is essential. It is essential to bringing a contract in. A significant problem with major system acquisitions is an unrealistic schedule. An unrealistic schedule is the result of optimism and/or a need or threat identified by the user or Pentagon.

Most programs in trouble have unrealistic schedules. For example, the engineering has not been completed before testing was begun.

Funds budgeted to support participative requirements.
This is needed. It would be nice and very good, but AFSC does not usually get the budget to do this. What is fundamental to successful major systems acquisition is budget stability.

Detailed requirements generated by the user. This is essential. User involvement in requirements definition is vital. The level of detail required depends on the maturity of the program, and on what is being procured. In the Air Force the user generates the need, and as the engineering evolves so does the detail of the user's knowledge which leads to more detailed requirements. If there are no broad alternatives to meeting the user's need, as in a rehosting, then the user would be able to write very detailed requirements.

Stability of requirements is very important. The user presents their Statement of Need (SON) at the very start of the acquisition process. The AFSC then provides alternatives that meet the SON. The user selects the alternatives and, engineering development begins. As the engineering matures, the user refines his requirements. This is an evolutionary process which leads eventually to a field weapon system.

Problem resolution impacts contractor payment schedule.

TEAMWORK

Teamwork is the proper term for how the government and contractor should interact. In today's environment the Air Force is being criticized for being too close to contractors. A few years ago it was for being too adversarial.

Actually teamwork is a delicate balance, a large grey area. It is important to cooperate, but also important to maintain an 'arms length' relationship. It is very counterproductive when a Program Director forgets this.

All constituents involved in planning and scheduling. Very good. Probably a good lesson learned. Applicable to the Air Force, but not really used. Basically getting a baseline to manage the program against. The way that this was handled with Host is very interesting, ie. having intensive discussions with all participants immediately after contract award. This is something that the DOD usually does not do well. After the contract is awarded the pressure to dig in and understand what the SOW actually says is off. Also, contractors do not man-up early enough. The main point is the necessity of getting a 'meeting of the minds.'

Lateral communication channels open. Award Fee forces communication, and can also facilitate teamwork. Essential.

Frequent meetings used to resolve differences. Recommend rewording this element to, meetings frequent, people prepared and action items tracked. This is good only if people are prepared for the meeting, and if action items

are tracked. Frequent meetings are not a prescription for success themselves. More important, both sides prepared to resolve problems at the meeting. Meetings are important to keep the channels of communication open, but everyone needs to know why they are there, and the action items need to be tracked.

Responsibilities accepted, not assigned.

One face to users and management.

All functions involved in problem resolution. Yes.
Adversity sometimes builds teamwork.

PARTICIPATIVE LEADERSHIP

The Air Force climate is changing from minimal to maximum user participation. The user is now involved in evaluating changes, and has the responsibility to make the decisions. Some major SPOs have full time co-located users. This facilitates communication, and reduces the chance of misunderstanding. I don't know if we do it enough, it depends on the size of the program.

User involvement is very important. Continuous dialog with the user on requirements is also very important. The user has an operational perspective while the SPO has a developer's perspective. The user can help identify what the SPO sometimes downplays, spares, documentation, and help make sure that the system is supportable.

It is also effective to use the same techniques outlined in this category to involve the SPO with the contractor. The Air Force has found it effective to send SPO people out to the contractor's plant to stay for one or two months. A new individual is rotated in as the old is rotated out. The SPO and AFPRO need to work as a team and this plan will not supplant that. The AFPRO is a monitoring function, and the SPO individual helps to integrate the engineering functions. Also, the AFPRO does not work for the PM, but the SPO people do. Therefore the PM can direct what they monitor and the PM is more assured of "lead time" for engineering problems. This could be used very effectively as preventative medicine, for the daily running of a large program. From experience, this is very hard to do, but very effective.

Site representatives involved from start to finish.
Yes

User input requested in all areas and all phases. Yes

Site input actually used. Very important. Otherwise the user will see right through you.

Users kept informed, frequent site briefings and memos.

Problems solved at the lowest level possible.

Users allowed to voice disagreements and concerns.

FOCUS

It is important to be tough on additional scope and studies. This is "right on." You need to keep the contractor and SPO both focused on the heart of the problem.

No bells, whistles, or additional fixes were added.

Innovation restricted to the original problem scope.

Studies performed by support contractors limited.
Interesting catch, never seen written down before. The first new thing. Agree, studies can dilute an effort significantly. It is important to be tough on these.

CONTRACTOR AND SYSTEM MONITORING

It is important not to tell the contractor how to do the work. Don't impose our "neat ideas" on the contractor for engineering fixes. It is the SPO's job to monitor progress, not to provide solutions. As long as the SPO fundamentally believes what the contractor is doing will work it is OK to present alternatives, but once presented leave the contractor alone with it. But, if the SPO knows that the contractor's method will fail then the PM must tell them. If a contractor's method is very risky then the PM should tell them, and have proof to show them.

The program manager's job is to keep the program in a "risk basket" that is acceptable. The SPO should do their own engineering analysis in the areas that are risky.

Actual demonstration of requirement before sign-off.

Technical Performance Measures established up front:
Agree. This is necessary and it should be done up front and jointly. If these are not in place at the beginning, then "the cows are already out of the barn" by the time you get the data. In addition to the data as to why we are in trouble, we also need lead time notice of problems. These should evolve as the SPO "gets smarter."

Software design indicators are a "black art." We are just now getting a handle on these, yet they are fundamental to bringing in an effort like Host.

RMA established up front, and achievable.

All problems categorized and visible in INFO database.

Numerous indicators of program progress used. Agree, it is important for you to get your own data and do your own analysis in parallel. This is NOT a question of trust, this is prudence and good management. It is not necessary to find a problem, just an inconsistency. The inconsistency highlights an area where questions should be asked.

TESTING AND TRAINING

Testing as early in development as possible. Yes, this is necessary, but in the proper configuration. The item being tested must be representative of the final product, or else you can get a false sense of security.

Both structured and unstructured testing conducted. Very good. An added benefit is user involvement. The Air Force uses Independent Verification and Validation (IV&V) testing, which may be similar to the unstructured testing used in Host. IV&V testing is performed by an independent contractor who makes sure that the item doesn't do "unintended things." Structured testing on the other hand checks that the item does what it is intended to do. IV&V depth depends on the ramifications of unintended occurrences.

User involved in planning and performing test scenarios. Agree.

Site personnel trained before system delivery. Yes, this is necessary but it is not often done. Not sure why it is not often done, maybe because the PM hasn't planned for it, or maybe because the primary focus of the SPO is on "making it work" versus logistics issues.

After delivery, detailed site specific testing conducted.

CONCLUSION

Fund stability is also essential. Once funding stability is gone, you really have program problems. A new step is being taken at AFSC to terminate programs if there are insufficient RDT&E funds instead of stretching the programs out. The old technique of stretching the program escalated both cost and schedule.

The program management "menu for success" according to Colonel Tourino:

1. Schedule - realistic
2. Funding - stable
3. Communication - to agree on what you're doing
4. Tracking - progress and action items

General Randolph's primary goal is user involvement. It is not the job of AFSC to tell the user 'no', but rather to tell the user what the alternatives and consequences are.

There has been a revolution at AFSC in the last year. There is a major push for realistic schedules. HQ AFSC is telling the customer that this much time and money is needed to meet each alternative. It is up to the user to select the alternative, but not dictate the schedule and cost. HQ AFSC is becoming more proactive.

There is no magic to the program management business, just common sense. It is necessary to take a stronger stand, to worry about something other than CYA.

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Vita

Lieutenant Barbara J. Cohen was born on 27 March 1959 in Denver, Colorado. She graduated from high school in Longmont, Colorado, in 1977 and attended Colorado State University for one year. Lieutenant Cohen graduated cum laude from the University of North Dakota with a Bachelor of Science in Business Administration degree in May 1982. She majored in accounting and passed the Certified Public Accountant Exam in November 1984. After working in industry for several years she received a commission in the USAF through Officer Training School. Lieutenant Cohen served as Chief, Materiel Management Branch for the 6505th Supply Squadron at Edwards AFB, California until entering AFIT in June 1987.

Permanent Address: c/o Barbara Garwood
Apartment # 627
373 North Wilmot
Tucson, Arizona 85711

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→ The primary purpose of this investigation was to develop an acquisition management strategy applicable to DOD program management that would help program managers achieve acquisition success. A hypothesized management strategy was formulated from the exploration of the successful Federal Aviation Administration's Host computer program. This exploration used personal interviews to identify those management elements and organizational procedures perceived by the 28 respondents to contribute to Host success. The hypothesized management strategy was subsequently evaluated by experts in DOD acquisition. Through personal interviews each element in the management strategy was evaluated for necessity to achieve program success and applicability to DOD programs.

The conclusions and recommendations of the study were based on the results of the DOD acquisition expert opinion survey of the hypothesized management strategy. The result was a management strategy to guide DOD program managers in achieving acquisition success that can be tailored to all programs. *Knowledge*

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